

The AUTOMOBILE

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Hudson Dealers Made Big Money Last Year—Did You?

This year their sales will be larger, their profits greater. They start the year with 27,000 enthusiastic Hudson Super-Six owners.

No one questions the supremacy of this car. By winning all the worthwhile records, by its appearance and quality, it has become the largest-selling fine car in the world.

Last year Hudson dealers could not fill the demand. Thousands of buyers waited months for deliveries. Many took a second choice car because they could not get a *Hudson Super-Six*.

Dealers in other cars did an increased business, but they sold second choice cars. The production of the Hudson Super-Six will be increased, but probably never enough to meet the ever-increasing demand for the Super-Six.

Do you want to take care of this over-flow trade by continuing to sell second choice cars?

Wouldn't you rather sell THE car that people WANT and will eventually buy—The *Hudson Super-Six*?

Hudson dealer franchises, like Super Sixes, are in great demand. It is only rarely that any of these great money-making opportunities is open. We want the name of every *real* automobile merchant, however, for the time may come when it will be profitable for both of us to know each other.

Something may arise in your community that will cause us to change our representation. When that time comes, we want to know you, provided you are the kind of man who will measure up to Hudson dealer standards. If you think you do—write us.



HUDSON MOTOR CAR COMPANY
DETROIT, MICHIGAN



There Is Money In Accessories

Put your accessory business on a big paying basis. You can easily do it. Make your accessory department the most profitable by handling only standard accessories of known value, accessories that virtually sell themselves.

Stock up with Stewart Products. They are best known, most advertised, and easiest to sell.

As a Stewart dealer, you tie to Stewart success and Stewart advertising—both the biggest in the accessory field. You get added prestige and an accessory business that's decidedly worth while.

And remember, Stewart Products make the hardest competition.

Take the Stewart Tire Pump for instance. It is standard equipment on many of the best cars. It is the one tire pump recognized by the motor car industry. Consequently, it is the easiest to sell—and hardest to compete with.

The same is true of the Stewart Warning Signals, Stewart Vacuum System, Stewart Speedometer, V-Ray Spark Plugs—and all other Stewart Products, including the famous combination Stewart Speedometer and Instrument Board for Fords, selling for \$11.25.

Don't waste your time, money and efforts trying to sell unknown, unadvertised accessories.

"It will pay you to see that every car is Stewart equipped."

Stewart - Warner Speedometer Corporation
Chicago U. S. A.

Stewart
Tire Pump

Warner
Auto-Meter

\$50

The AUTOMOBILE

VOL. XXXVI

NEW YORK—THURSDAY, FEBRUARY 22, 1917—CHICAGO

No. 8

Stutz Earns \$8.65 Per Share

Net Profits \$649,042—Sales in 7 Months Total \$1,771,328—1535 Cars Sold

INDIANAPOLIS, Feb. 16—Net profits of \$649,042 for the year ended Dec. 31, 1916, are reported by the Stutz Motor Co., this city. These are equal to \$8.65 per share on the 75,000 shares of stock, no par value of the parent company, the Stutz Motor Car Co. of America, which took over the local company in June last, owning all of its capital stock.

The income account for the 7 months ended Dec. 31, shows net profits for the period of \$381,061, equivalent to \$5.08 per share. During that period \$1,771,328 in cars were sold. During the whole year the company produced 1535 cars, an increase of 42 per cent over 1915.

Within the past year the company has completed its new building, so that it now owns and occupies the entire square block from 10th Street and Capital Avenue. In addition to its new building the company has leased another building wherein it has installed new machinery at a cost of about \$75,000 for the manufacture of its new 16-valve motors.

The entire expected maximum output of cars for 1917 has been contracted for.

The income account for the 7 months ended December appears at the right.

Hal Offers Four Standard Colors

CLEVELAND, Feb. 17—The Hal Motor Car Co., this city, has offered four colors as standard finish to its models this season. Any one of the six styles of bodies mounted on the Hal twelve chassis can be purchased finished in a gun-metal gray, a maroon, a thistle green or a special Hal blue. Further, to give the purchaser an opportunity of expressing his own personality, an option is given

by the manufacturers of having the wood wheels of the car painted any color the buyer wishes and the body striped in any one of several colors that harmonize with the color of the car in question.

Utz Standard Parts Chief Engineer

CLEVELAND, Feb. 19—J. G. Utz has been appointed chief engineer of the Standard Parts Corp. Mr. Utz was with the Perfection Spring Co. for 5 years. E. W. Dunston has been appointed chief engineer of the spring division and R. A. Townsend has become chief metallurgist in charge of the laboratories of the spring division.

The corporation will open executive offices soon in the heart of the Cleveland business district.

Willys-Morrow Co. Incorporated

TOLEDO, Feb. 20—The Willys-Morrow Co., this city, has been incorporated for \$100,000 under the Ohio laws to manufacture automobile parts and to take over the Morrow Mfg. Co. John N. Willys is making this move to have all the subsidiary companies under the same laws as the parent company. The Morrow Mfg. Co. was a New York corporation.

STUTZ INCOME FOR 7 MONTHS

Net sales	\$1,771,328
Cost of sales	1,374,066
Gross profit on sales	\$397,261
Selling and general expenses	44,747
	\$352,513
Interest and discount earned	28,547
Profit for seven months	\$381,061

The output and net profits for the past 4 years compare as follows:

Year	Output	Net Profits
1916	1535	\$649,042
1915	1079	366,475
1914	649	151,106
1913	759	292,080

The condensed balance sheet follows:

Assets	Liabilities
Fixed assets \$331,603	Payables \$356,980
Goodwill 2,190,000	Deposits on
Cash 74,060	cars 17,700
Receivables 145,530	Taxes 8,500
Inventory 577,248	Reserves 31,239
Total \$3,228,441	Surplus 2,439,022
	Stock at \$5. 375,000
	Total \$3,228,441

Quantity Production for Redden

\$4,000,000 Company To Have 20 Assembly Plants—To Make All Parts

NEW YORK, Feb. 17—Quantity production, backed by a \$4,000,000 capital, is the basis of the big merchandising plan of the Redden Truck Co., which has just completed its organization for the manufacture of the Redden-Truck-Maker.

Twenty branch assembly plants in twenty of the largest cities in the country are part of the manufacturing and merchandising plan of the company. The main factory of the enterprise will be located either at Joliet, Ill., Jackson, Mich., or Chicago, where the people interested already have large manufacturing interests. Subsidiary plants will be installed and operated after the Ford plan.

Prominent in the organization of the Redden company are the following: Horace DeLisser of the Ajax Rubber Co.; H. W. Cowan, capitalist and former associate of F. W. Woolworth; C. A. Bickett, president of the Chicago Bearing Metal Co.; L. B. Patterson, Chicago banker; and W. K. Pritchett, of the New York banking house, Pritchett & Co.

A coterie of Chicago and local banking and manufacturing interests have arranged to re-finance the company and place it in a position to manufacture the attachments complete in plants that will be allied with the Redden company. This will enable the company to make the job complete from the rolling of the channel steel for the frame to the building of its own tires.

Graham Joins Pierce-Arrow

BUFFALO, Feb. 20—G. M. Graham has been appointed assistant commercial manager of the Pierce-Arrow Motor Car Co., this city. Mr. Graham was formerly with the Willys-Overland Co.

Ford Tractor Co. In Canada

\$10,000,000 Concern to Take Over Interests There of Ford Tractor Co., Inc.

FORD CITY, Feb. 19—The Ford Motor Tractor Co. of Canada, capitalized at \$10,000,000, has been incorporated and will have its head offices in Canada. It will build, construct, operate and prepare for the market, motor tractor engines, machinery and equipment in connection with the manufacture and operation of tractors and will take over the business in Canada of the Ford Tractor Co., Inc., including patent rights within the Dominion for the Ford tractor.

The company will erect a plant in this city on a 50-acre site early this spring.

Ford to Give Up L. I. Plant

NEWARK, N. J., Feb. 20—The Ford Motor Co. will give up the Long Island City plant in about 1 year as soon as the buildings at Kearny, N. J., are completed. The company is now building docks at Kearny and will erect the buildings later. The company has 80 acres of land and the structure will be four stories. The export business will be handled there.

Ford Agents Replace Defective Parts

DETROIT, Feb. 19—Ford agents are receiving advice from the Ford Motor Co. saying that they may now make repairs and replace defective parts to cars if in the judgment of the agents such parts are defective, or if these defects are within 90 days after the date of the sale of a car. After this time has elapsed, they must be sent to Detroit.

In the past if the purchaser wanted a defective part replaced, it had first to be sent to Detroit or to the nearest branch for inspection.

Cupples Adds Tire Manufacture

ST. LOUIS, Feb. 16—The Cupples Co., this city, will increase its rubber department for the manufacture of a new type of automobile tires and inner tubes.

Gamble Partner in Advertising Firm

CLEVELAND, Feb. 16—T. S. Gamble has come a partner in the firm of Benson, Campbell & Slaten, with offices in this city and Chicago. He was formerly with the Maxwell Motor Sales Corp.

Warner Gear To Build

INDIANAPOLIS, Feb. 20—The Warner Gear Co., Muncie, will begin the construction of new buildings and the installation of equipment that will double

the capacity of the plant. The company's capital stock has been increased from \$500,000 to \$1,500,000. The number of employees will be increased from 1000 to 2000 when the improvements are completed.

Frost Gear Elects Officers

JACKSON, MICH., Feb. 19—Officers and directors for the ensuing year were elected by the Frost Gear Co. at the annual meeting held Tuesday. The officers are as follows: President, E. E. Frost; vice-president, M. C. Townley; secretary, Robert Smith; treasurer, A. S. Glasgow. The board of directors includes the officers and Thomas Woodfield, E. J. Weeks and James Heaslet, the latter of Detroit. Mr. Heaslet also holds the office of vice-president in the company.

Canadian S K F Co., Ltd., Formed

TORONTO, ONT., Feb. 17—The Canadian S K F Co., Ltd., has been organized and will manufacture and sell S K F bearings in the Dominion of Canada. Headquarters have been established at 47 King Street, West.

Akron Rubber Production \$188,000,000

Twenty-seven Companies Averaged 40,000 Tires Daily in 1916
—Rubber May Replace Leather

CLEVELAND, Feb. 17—Last year the twenty-seven rubber companies of Akron manufactured rubber products valued at \$188,000,000, according to Dr. W. C. Geer, director of processes of the B. F. Goodrich Rubber Co., in an address before the Cleveland Engineering Society here to-day. He said the output of these rubber concerns was 40,000 tires daily. Dr. Greer predicted that within 2 years the rubber business would replace a large part of the leather business, and that shoes now made of leather would be made of rubber.

Jay Joins Engineering Firm

NEW YORK, Feb. 17—John C. Jay, Jr., has joined the firm of Jamieson, Houston & Graham, consulting engineers. Hereafter the firm will be known as Jamieson, Houston, Graham & Jay. Mr. Jay was formerly chairman of the board of directors of the Maxwell Motor Co. and vice-president of the Pennsylvania Steel Co.

Brown an Elgin Director

INDIANAPOLIS, Feb. 20—W. H. Brown, of this city, formerly vice-president and assistant general manager of the Willys-Overland Co., has been made director of sales of the Elgin Motor Car Corp., Chicago.

Purchaser and Seller Financed

Commonwealth Finance Corp. to Aid Sale of Cars and Trucks by Time Payments

NEW YORK, Feb. 19—The financing of the purchase of commercial vehicles and passenger cars upon the time-payment plan is included in the scope of the Commonwealth Finance Corp., incorporated under the laws of South Dakota with a capital of \$10,000,000 7 per cent cumulative preferred and \$7,500,000 common. The fiscal agent is Sargent & Co., Minneapolis. An office will be opened in the Trinity Building, this city.

According to the plans of the company, it will purchase from responsible dealers deferred-payment paper on cars which they have sold. Such paper, carrying the endorsement of the dealers together with that of the company, can readily be resold at a profit.

Purchasers of automobiles will also be financed, the security being a mortgage upon the car itself or a contract whereby the title to the car remains in the name of the Commonwealth corporation until the last payment is made, together with an insurance policy covering fire and theft. The margin of security will be ample, as the company purposes to accept deals only on terms where the amount outstanding on deferred payments is fully covered by the forced-sale value of the car.

780 Members in Detroit S. A. E. Section

DETROIT, Feb. 16—The membership committee of the Detroit section of the Society of Automobile Engineers held a meeting last week, at which Chairman W. C. Keys reported that the section has increased its membership by more than 100 members within the past 3 weeks and now numbers a total of 780. It is now expected that the section will have 1000 members by April 1.

Salesmanship Congress in Detroit

DETROIT, Feb. 17—The 1917 annual session of the World's Salesmanship Congress will be held in Detroit. The date has not yet been definitely decided.

\$2,000,000 Order for Denneen Truck

CLEVELAND, Feb. 17—The Denneen Motor Co., this city, has just received from the Commercial Vehicle Motors Co., Chicago, shipping orders for \$2,000,000 worth of motor trucks. The order calls for 2000 trucks of a new model, the details of which will be announced later.

No Racing Cars from Europe

Speed Creations Taken Over by Governments—Fiats May Reach U. S.

PARIS, Feb. 10.—There appears to be an impression in America that Europe can still provide a few racing cars. The fact is that all the European factories have been swept clean of all their speed creations and have had no opportunities of making new ones since the outbreak of war. In August, 1914, successful racing cars were to be found in the Peugeot, Delage, Sunbeam, Mercedes, Fiat, Opel, and Nagant factories. Vauxhall had a set of cars which might have become successful if six months' more work had been put into them. All the Peugeots have been shipped to America, and the Peugeot factory is incapable of producing any more machines for its race team has been broken up, its race engineer having formed an independent company to manufacture aviation engines. Boillot has been killed and Jules Goux is a lieutenant in the French army. Delage has also sold all his cars with the exception of Guyot's machine which finished third at Indianapolis in 1914. This has been converted into a fast runabout, for its cylinder capacity exceeds the 300-in. limit. Delage has maintained his complete organization, but is too busy on army work to produce racing machines. Sunbeam made a new engine for the 1914 Grand Prix racers and sent one to America last year, but it is understood no more have been built, except the two for Rickenbacher.

Mercedes Has Racers

Mercedes possesses the most successful racing cars, but unless the British fleet can be put to sleep they will not reach America until after the war. It is known that several persons have tried to get the machines out of Germany, but have had to abandon the attempt. The Opel cars are less interesting, but they also are unavailable by reason of the blockade. Fiat has two of the last French Grand Prix cars, and it is likely that they will reach America in the spring in order to race for the new American Fiat Company, now controlled by the parent factory. These are the only available cars, and they are not for sale. The 300-horsepower Fiat is at the Turin factory, where it has been lying since Arthur Duray made his attempt on the world's kilometer record. The car, however, is privately owned and does not appear to be for sale. Also its dimensions put it out of competitive racing. The Nagant factory is in Belgium and only the Germans know what has become of the set of 1914 racing cars run at Lyons.

Although there are no racing machines available now, indications are that they will be produced on the declaration of peace. All the automobile factories have secured a strong financial position and have had wonderful experience on aviation engines. Engineer Henry, who was responsible for the Peugeot engines, states that since he took up aviation motor design and construction he has learned more than he ever considered it possible for a man to learn. Other firms have acquired valuable experience and will be anxious to show their worth by producing special racing creations. In a few cases drawings have been prepared, but of course no constructive work has been done.

Fords Must Be Sold Before Shipped from Plant

DETROIT, Feb. 16—Owing to freight conditions, the Ford Motor Co. is not permitting its dealers to stock up with cars. Shipments are made only after the car has actually been sold. In this way the cars have moved exactly in accordance with sales and not in accordance with the individual estimates of the dealers on the number of cars that will be sold in a certain territory. The dealer is, of course, allowed to have a show car and a demonstrator.

Republic To Control Torbensen

Acquisition of Stock In No Way Alters Policy or Management of Axle Co.

ALMA, MICH., Feb. 19—The Republic Motor Truck Co. is arranging a plan to obtain control of the Torbensen Axle Co. of Cleveland. The plan will allow the Tobensen company to continue the manufacture of axles for practically any concern that wants to purchase them.

As arranged, the plan calls for an increase of capital stock in the Republic company whereby 15,000 shares of new stock would be offered to stockholders at \$100 per share. The Republic company expects to secure control of all of the issued common stock of the Torbensen concern, of which there are 7500 authorized, par \$100 and 3950 outstanding. There are also 10,000 shares of \$100 par preferred, of which 5000 shares have been issued.

It is stated that this deal will give the Republic company control of the only internal gear patents in existence.

Management Unchanged

CLEVELAND, Feb. 21—Acquisition of some of the Torbensen stock by the Republic Motor Truck Co. in no way alters the policy or management of the Torbensen Axle Co.

Peerless and Grant Raise Prices

Former \$90 to \$100 Higher—Latter \$50 More—Effective Feb. 28 and March 1

NEW YORK, Feb. 19—The Peerless Motor Car Co., Cleveland, will raise its prices Feb. 28. On that date the touring car and roadster selling at \$1,890 will be \$1,980; the Sedan, now \$2,750, will be \$2,840, and the limousine will rise in price from \$3,260 to \$3,350. The sporting roadster and the coupé will remain at their present prices. Peerless officials state there will be no new passenger car model offered by the company this year.

The big addition to the Peerless plant will be ready for occupancy March 10. The annex to the factory comprises 150,000 sq. ft., which will be devoted exclusively to the manufacture of passenger cars. Building operations on the addition have been under way since October, 1916.

Grant Six Price \$50 Higher

CLEVELAND, Feb. 18—The price of the Grant Six will be raised from \$825 to \$875 on March 1.

Dayton Becomes Ajax Sales Manager—Matlack Resigns

NEW YORK, Feb. 16—F. E. Dayton has become general sales manager and a director of the Ajax Rubber Co. This promotion comes to Mr. Dayton following the retirement of J. C. Matlack, whose resignation was accepted last week at the annual meeting of the company.

Mr. Dayton has been associated with the Ajax company for 4 years and has been assistant in charge of the tire sales. Previously he was sales manager of the Columbia Motor Car Co., Hartford, and branch manager in Boston and Chicago for the Electric Vehicle Co.

Mr. Matlack, who was secretary and general manager, has been a prominent figure in the tire industry for the past 15 years and has been connected with the Ajax company for the past 8 years. He entered the tire business as president of the International Automobile & Vehicle Tire Co., Middletown, N. J., succeeding Harrison Williams. When that company was sold to the Michelin Tire Co., he became vice-president and general manager. He left this company in 1909 to join the Ajax company as general manager.

He will take a few months' rest, after which, it is expected he will announce his plans for the future.

Automobile Industry Will Lead in National Defense Preparations

Should War Come, Its Plants Will Be Prepared To Play Important Part in Production of Munitions—Coffin Will Direct Munitions and Automobile Plants

WASHINGTON, Feb. 20—The automobile industry as an industry will undoubtedly be called upon to play a most important part in an industrial way in the work of preparing for the national defense should this country become involved in war with any foreign country. And, in addition to this, this industry is to be called upon to get ready to do its bit in an effective way by turning, in the very near future, to the manufacture in small quantities of certain articles of defense, according to Howard E. Coffin, chairman of the Council of National Defense.

Mr. Coffin stated, in an interview granted the representative of *THE AUTOMOBILE*, that the automobile industry would be called upon to build aeroplanes, motor boats, motor vehicles of various kinds, tractors, armored cars, trucks, some passenger cars of the kind needed for the quick transportation of officers and men, and motors, alone. Automobile plants, however, would not be restricted to the kind of manufactures to which they ordinarily give attention as many of them, those found to be best suited for the purposes, would be turned to the manufacture of metal work such as shells, arms, etc. On the theory that education in time of peace constitutes one of the essentials of practical preparedness, Mr. Coffin said, attention is to be given to the placing of small orders with such plants that they may begin to assemble the machinery necessary, and instruct their workmen in the making of these articles, so that in case of an emergency the managements can turn quickly and effectively to such tasks on a big scale.

Educating Producing Resources

The question of the education of producing resources has been given close attention by Mr. Coffin and those engaged with him in the Council of National Defense. It has been agreed among members of the Council that a policy involving small, educational orders is the one to pursue at this time, and this policy has been finally adopted. Mr. Coffin has been placed in charge of a committee which will have to do with manufacturing establishments and munitions plants.

Mr. Coffin is now giving his close attention to the practical carrying out of this plan for the introduction of the craftsmanship of the munition maker into manufacturing establishments which have never previously made munitions.

This preliminary work will precede all other steps along this line. As a result, the factory which is now engaged in the making of automobiles will not be called upon to make a departure sufficiently radical to interfere with its usual operations, but it will be urged to turn attention to a limited extent to small government orders of a particular kind for which it will be paid the prevailing prices for such manufactures.

So numerous have the automobile factories of the country become, and so extensively are they operating, that, while some might, should war come, be continued as manufacturers of automobiles of various types, alone, a very large proportion of them would doubtless be called upon to convert their plants into the making of munitions or parts of munitions.

Accessory Makers' Part

Naturally, according to Mr. Coffin, the accessory manufacturers would be most apt to be relied upon for the making of fuses and other small munitions parts. The lack of plants equal to the task of turning out aeroplanes in any considerable numbers to-day would mean almost certainly that this work would fall upon the automobile manufacturers. The same would be true as to motor boats.

This being true, the time required to change the automobile establishments over from a peace to a war footing would depend upon the extent to which they had given attention to the education of their employees along the lines suggested to them by Mr. Coffin and his aides. Mr. Coffin made it plain in his talk that manufacturers would not be called upon to do an unreasonable lot of work for the Federal Government in turning out the articles for which orders would be given them, but only enough to result in training a sufficient number of men along specific lines of manufacture to form the nucleus for a larger force to work under the direction of these craftsmen.

Mr. Coffin presided over a meeting of defense societies representing all sections of the country at a meeting held on a call issued by him. The object of this meeting, as explained in the call, was to form a national organization which would work in harmony with the smaller and more compact body, the Council of National Defense, and to aid the members of the latter organization in carrying out plans for mobilizing the industries of the coun-

try, on which they have been working for months.

National headquarters will be established in Washington by this new body, and it will be composed of representatives of at least forty societies. To a limited extent the information gleaned by the Council of National Defense as to what may be expected from the industries of the United States based on the survey of the same recently completed, will be imparted to the new national body. This survey covered 27,000 establishments to which questionnaires were sent out and there is now safe in the vaults in the war and navy departments detailed and technical information as to what might be expected from each of these 27,000 establishments in the way of the manufacture of arms, munitions, and equipment.

Automobile Industry Leads

The Council of National Defense now in session in Washington has decided that the automobile industry of the country will be placed in the first line of industrial defense in the event of war between this country and Germany, which, day by day, grows more imminent, and Howard E. Coffin of Detroit, president of the Hudson Motor Co., will be in charge of the operation of that industrial section of which the automobile industry will be a part. So critical is the outlook regarded announcement has been made that from now on Mr. Coffin will not leave Washington for any length of time except on defense matters until there is a change in the international situation.

Mr. Coffin has been placed in charge of munitions plants, as well as automobile and other strictly manufacturing establishments. At this writing the Council had not reached the point of deciding upon the specific uses to which the automobile and other manufacturing establishments will be put, as Mr. Coffin will be relied upon to work out these details, his intimate knowledge of the manufacturing business equipping him in an exceptional way for such a task.

W. F. Gifford, director of the Council, states that it has not yet been possible to so classify the information already collected that a knowledge might be gained of the extent to which the industries could be relied upon in an emergency, but that such classification will have been completed shortly. Due to the facilities of the automobile establishments of the United States, and based upon expressions by high officers in a position to know, it may be relied upon that this industry will be early called upon to do a big share of work necessary to an adequate national defense.

Further, it is understood, the information in the hands of the Council, gained through a most systematic survey of the industries of the country, is such as

satisfy the members that the automobile industry is already in a most gratifying condition as far as prompt and effective co-operation in work along industrial lines is concerned. It has been stated in connection with the meeting of the Council that events transpiring during the war in Europe have demonstrated so forcibly the important place which the motor industry occupies in its relation to the needs of modern warfare that the entire resources of such in this country are certain to be drawn upon.

Mr. Coffin's first work in charge of manufactures and munitions will be in connection with the standardization of industrial processes so that the conversion from peaceful to wartime activities can be accomplished in the shortest possible time and with the least loss of energy. This work is almost certain to be first directed to that branch of industry with which he is most familiar, the automobile, and then in proportion to their magnitude and manufacturing importance, the others.

Appointments Made

President Daniel Willard of the Baltimore & Ohio has been placed in charge of transportation and communication by the National Council, and he has arranged to make the American Railway Assn. the instrument for handling all transportation of men and supplies. Dr. W. H. Martin of Chicago, a member of the Council, will handle all problems of general sanitation, and direct the medical work. Dr. Hollis Godfrey of Drexel Institute, Philadelphia, will be in charge of scientific work, including engineering and educational problems, and research.

Bernard Baruch of New York will be in charge of the rounding up of raw materials, minerals and metals. E. S. Stettinius of Morgan & Co., New York, who has handled details of all purchases in this country for the entente allies, appeared before the Council this week and discussed the most effective manner of mobilizing supplies.

Overland Offers Plant to U. S.

TOLEDO, Feb. 17—John N. Willys has telegraphed President Wilson that the Willys-Overland plant is at the service of the United States Government. Nearly all the big automobile companies have offered similar services since the severing of diplomatic relations with Germany.

Goodrich Adds 38 New Stores

AKRON, Feb. 18—Thirty-eight new stores will be opened by the B. F. Goodrich Co. March 1. These will serve as distributing points for dealers in their territories. The managers have been taking an educational course at the Akron factory under the personal direction of A. Kohler.

Dealers May Be Without Cars

Shipments from the West Are Weeks Behindhand—Makers Plan Relief Methods

NEW YORK, Feb. 19—"Thirty days of sunshine will mean that New York will be without any new automobiles." Such is the present prospect in the Eastern market, in the opinion of one of the largest metropolitan agencies. In an extreme form this expresses the fact that shipments to New York are irregular, behind time from 3 days to 5 weeks, and coming in smaller quantities than the local buyers demand.

Several companies are taking special methods to relieve the freight shortage situation. Willys-Overland gets one trainload of cars from New York weekly, and has to unload the train immediately and return it. The company can make no individual shipments. Studebaker is using the greater part of its traffic force in the actual physical work of spotting empty freight cars and getting them loaded. The company also has a follow-up system which keeps track of each car and sees to it that the dealer unloads quickly.

There are no freight shipments at all out of Pontiac, Mich., which means that the Oakland cars are all coming east by express and are going to nearby points under their own power. Buick and many other companies report that when the spring rush comes the chief way that New Yorkers will be able to get cars, will be to have the automobiles driven out from New York under their own power.

The headquarters of the trouble is at Detroit. At one time there were 25,000 loaded cars in the city awaiting shipment. Once they get started it is hard to get past Buffalo. "An order that would usually get to us in 7 days from the factories, now takes from 3 to 4 weeks," this expression of opinion from one of the Broadway dealers, is characteristic of the testimony all along the row.

\$10,000,000 in Cars Delayed

More than \$10,000,000 worth of automobiles are tied up in Detroit because of existing freight conditions produced by embargoes declared by thirty railroads since the beginning of the U-boat war. These figures are based on a statement made by J. S. Marvin, general traffic manager of the National Automobile Chamber of Commerce, who states that "unless something improves matters radically in the next few weeks, the situation will become even more serious. Mr. Marvin found that there are more than

25,000 empty freight cars tied up in Chicago."

All of the factories are driving cars to the different dealers and every train carries distributors and drivers to Detroit who come to drive cars back to their cities.

The Packard company has approximately \$1,000,000 worth of cars tied up and is driving its products to Toledo, Cleveland and Columbus. The Ford Motor Co., which requires at least fifty empties daily, is now securing from six to ten each day. Dodge Bros. are sending cars under the "drive-away" rule and are thus shipping an average of 150 per day. The Cadillac Motor Car Co. has 1000 cars ordered, paid for and ready for shipment which it has been forced to place in storage because of lack of shipping facilities. The Paige-Detroit company is in the same position.

The Chalmers company has 300 cars in storage and is threatened with a shortage of material. More than 400 cars lay idle at the Hupp Motor Co. plant with little prospect of early shipment, and the company has been paying express charges of \$250 per day in order to secure materials from Cleveland alone.

Maxwell, Hudson, King and other big concerns are experiencing the same conditions and all are busy fitting their products for those drivers from the different agencies who come to navigate the cars over the roads to their home towns. And many companies are driving their cars to nearby cities where they hope to secure better shipping facilities.

Falls Sends Engines by Express

SHEBOYGAN FALLS, WIS., Feb. 19—The Falls Motors Corp., Sheboygan Falls, Wis., is forwarding engines to its customers beyond Chicago in carload lots by express because of the demoralized freight traffic situation throughout the country. One of the largest users of Falls motors is the Grant Motor Car Corp., Cleveland, and several express cars are loaded each week to keep the big factory supplied with motive units while the freight tangle continues.

Haynes Driving Cars Overland

INDIANAPOLIS, Feb. 20—The Haynes Automobile Co., Kokomo, is avoiding inconvenience and a business tie-up from freight embargoes by driving cars overland under their own power. Twenty-six touring cars were shipped to Detroit, Mich., in this manner last Tuesday, and twenty-five cars left for the same destination last Friday night. Since the freight embargo delayed shipments the company has shipped cars under their own power as far east as Johnson City, N. Y., a distance of 790 miles. Cars are to be sent to dealers in the same manner in Cleveland, and Cincinnati, Ohio.

Wyandotte Business Doubles

Detroit Truck Company Shows Surplus of \$80,438—Officers Re-elected

DETROIT, Feb. 19—The Detroit-Wyandotte Motor Truck Co. held its annual meeting last week and showed that the volume of business handled by the company in 1916 was approximately double that of the year preceding. The financial statement shows net surplus of \$80,438.99 at the end of the year. Directors were elected as follows: G. A. Horner, M. O. Crawford, F. H. Hester, D. Rasch, J. J. Marx.

The directors re-elected the following officers: President and general manager, G. A. Horner; vice-president, D. Rasch; secretary and treasurer, M. O. Crawford.

Clark Carriage To Build Bodies

OSHKOSH, WIS., Feb. 19—The Clark Carriage Co., Oshkosh, Wis., for many years a leading manufacturer of fine horse-drawn vehicles, is effecting a re-organization and will engage in a large production of all kinds of bodies for motor vehicles. H. M. Clark will remain as president, and the factory management will continue to be in charge of H. M. Foulke.

Kent Offices in Belleville

NEW YORK, Feb. 16—Kent Motors Corp. of 1790 Broadway will move all their executive offices and allied departments to their factory at Belleville, N. J., on March 31. All business will be handled for the New Jersey headquarters after that date.

NEW YORK, Feb. 16—The Kent Motors Corp., Belleville, N. J., has filed plans for a new building, 50 by 200 ft., to be erected at its plant, now in course of construction.

Batavia Rubber Co. Re-Elects Directors and Officers

BATAVIA, N. Y., Feb. 16—The Batavia Rubber Co. has re-elected the following board of directors: G. W. Hodges and W. T. Remick, of New York; W. R. Smith, W. P. Berrien and C. M. Marvin, of this city.

The following officers were re-elected: Chairman of the board, G. W. Hodges; president, W. R. Smith; vice-president, W. P. Berrien; treasurer, C. M. Marvin; assistant treasurer, W. S. Whitman, of Batavia.

The stockholders will hold a special meeting on Feb. 23, at which time they will vote on a proposition to increase

their capital stock from \$500,000 to \$750,000.

The company has purchased about 2 1/4 acres of land adjoining the present factory. If certain arrangements can be made, the company proposes to bring the Simplex Rubber Co. of America, Ossining, to Batavia. The latter company manufactures solid rubber truck tires and a large line of mechanical rubber goods.

Merger Probable

Negotiations were started last year with a view of taking over the Simplex company, and during the past 2 weeks the local company has gained the consent of practically all of the stockholders, and in all probability the plant will be moved here.

Disbrow Motors Officials Appointed

CLEVELAND, Feb. 19—W. D. Callinan has been made first vice-president of the Disbrow Motors Co. of this city, of which Louis Disbrow is president. Edward P. Strong is second vice-president and Morris Becker becomes secretary and treasurer.

Apperson Plant Completed

INDIANAPOLIS, Feb. 20—The Apperson Bros. Automobile Co., Kokomo, has completed the construction of its new factory, new equipment has been installed, and an entire new plant now is in operation. The old buildings will be utilized, but practically all of the manufacturing will be done in the buildings of the new group. The new plant, pronounced by engineers as one of the most complete and perfect in the industry, was planned and built under the supervision of Elmer Apperson, president and general manager of the company.

Ton-A-Ford in Plant

RACINE, WIS., Feb. 19—The Ton-A-Ford Truck Co., Racine, Wis., organized recently by George Beardsley, Chicago, and H. J. Sanders, Racine, to engage in the manufacture of light motor trucks embodying the Ford chassis, is now located in its new plant, which comprises the buildings formerly occupied by the Perfex Radiator Co., Racine. The daily capacity will be twenty-five to thirty units. The Ton-A-Ford extension chassis retails at \$345.

Time Payments in Chicago

NEW YORK, Feb. 20—The Guaranty Securities Corp., this city, will on March 1 assume operating control of its plan of automobile time payments, in the Middle West and Rocky Mountain territory. The Guaranty Banking Corp., Chicago, will act as correspondent for the Guaranty Securities Corp., in the operation of this plan. Offices will be maintained in the Continental and Commercial Bank Building.

Packard Sales Race Starts

111 Dealers Begin Sales Race Lasting Until 2500 Cars Are Sold

DETROIT, Feb. 20—At 11 a. m. this morning 111 Packard dealers and their employees opened sealed orders telling them of a selling sweepstakes race starting Washington's Birthday at noon. The dealers have been divided into four classes and each class runs an independent race which will last until 2500 cars are sold. The 2500 cars have been divided into allotments graduated in size depending upon the number of cars sold so far this selling season. The selling season for the Packard company starts in August, and hence the number is based on past records from August to date.

When the race closes the dealer in each class who has sold the highest percentage of his allotment wins and will receive a prize. Of the dealers, 110 are in the United States and one in Honolulu. The score is to be kept on boards carrying a map of the Lincoln Highway. The distance across the continent is divided into 100 spaces, each space representing 1 per cent of quota. The racers start at San Francisco and when they have reached New York, 100 per cent of quota has been sold. For those who exceed 100 per cent quota imaginary vessels will bear them out to sea on the score board.

The race involves more than 800 salesmen and its purpose is a test of the Packard sales organization and to measure its efficiency in merchandising. Exercises will be held at the Packard factory on Washington's Birthday and President McAuley will start the race by pushing a button.

Collier Motor Truck Co. Formed

SANDUSKY, OHIO, Feb. 19—The Collier Motor Truck Co., capitalized at \$150,000, has been organized in this city to open a factory here with 100 men.

New Plant for Winther Truck

KENOSHA, WIS., Feb. 19—Ground will be broken shortly after April 1 for the first unit of the new plant of the Winther Motor Truck Co., this city. Plans are now being completed for the first shop building, to be 110 by 400 ft. in size, one-story, of fireproof construction, with sawtooth roof.

Winslow Resigns from Hupp

DETROIT, Feb. 19—P. E. Winslow, who for the past 3 years has been in the executive department of the Hupp Motor Car Corp., has resigned his position.

Ajax-Racine Profits \$1,268,311

Equal to \$9 Per Share—Total Assets Are \$8,629,061—Six New Directors

NEW YORK, Feb. 16—The number of directors of the Ajax Rubber Co. has been increased from nine to fifteen. The new directorate is the representation of the Racine Rubber Co., which was recently taken over by the Ajax company. Net profits of the Ajax and Racine companies, for the year ended Dec. 31, aggregated \$1,268,311, equal to \$9 per share of the outstanding stock.

W. J. Jackson, R. W. Patterson and H. K. Prichitt were re-elected directors

THE AUTOMOBILE

for a term of 3 years. H. L. McLaren, president of the Racine company, and L. T. Vance, vice-president of the Racine company, were elected vice-presidents of the Ajax Rubber Co. The following were chosen as directors: L. B. Patterson, of Chicago; H. L. McLaren, L. T. Vance, H. C. Severance, Stuart Webster and Joseph Weissenbach, of Chicago.

McQuay-Norris Makes Appointments

ST. LOUIS, Feb. 17—The McQuay-Norris Mfg. Co. has added the following sales representatives to its force: J. H. Bishop will travel out of the Kansas City branch office; A. F. Frost will travel out of the Dallas branch office; P. T. Egbert and G. T. Parsons will travel out of the New York branch office; J. H. Griffith, Pittsburgh office, and George Heidenreich, Cincinnati office.

Combined Balance Sheet Ajax Rubber Co., Inc., and Racine Rubber Co. for Period Ending Dec. 31, 1916

ASSETS	
Fixed Assets:	
Stock—Ajax of Delaware	\$5,000.00
Stock—Ajax of Oregon	5,000.00
Stock—Motor Association	100.00
Real estate.....	62,279.72
Buildings.....	435,032.19
Branch furniture and fixtures.....	52,533.38
Machinery at factories.....	570,685.48
Machinery at branches.....	752.61
Molds.....	228,834.07
Patents.....	1,473.99
Equipment at branches.....	400.00
Tools and equipment.....	32,909.29
*Organization expense.....	47,788.36
	\$1,442,789.09
Current assets:	
Cash on deposit.....	\$395,815.03
Advance to salesmen and branches.....	13,954.93
Personal accounts.....	1,724.51
Notes receivable.....	246,234.24
	657,728.71
Cash deposited with Fort Dearborn Trust and Savings Bank, Chicago, Ill., to redeem balance of outstanding Preferred Stock of Racine Rubber Company, as per contract.....	142,107.30
Accounts receivable:	
Sales ledgers.....	1,626,111.09
Deferred assets:	
Unearned insurance.....	\$14,678.27
Redemption of Preferred Stock.....	3,287.91
Claims account.....	843.74
Branch stock account.....	87.95
Deferred inventory adjustment account.....	43,898.26
Deposit Kansas City Water Department.....	5.00
*Organization expense.....	21,458.49
Employees stock contracts.....	8,500.00
	92,759.62
Good will.....	1,842,701.08
Inventories:	
Finished goods at branches.....	\$392,833.34
Finished goods at Delaware branches.....	186,258.87
Finished goods at Oregon branches.....	102,766.73
Finished goods at factories.....	529,693.83
Crude rubber.....	944,141.86
Duck sheeting, etc.....	282,215.68
Mill department material in process.....	34,429.61
Tire department material in process.....	129,722.49
Miscellaneous stores.....	222,801.91
	2,824,864.32
*To be amortised over a period of five years.	\$8,629,061.21
LIABILITIES	
Current liabilities:	
Accounts payable:	
Purchase ledgers.....	\$271,313.37
Ajax of Delaware.....	5,000.00
Ajax of Oregon.....	5,000.00
Income tax.....	608.01
Stock subscriptions.....	117.00
Philadelphia Branch Stock account.....	29.29
Special deposit account.....	249,935.00
Sundry accounts.....	639.14
	\$532,641.81
Notes payable.....	317,000.00
Reserve for depreciation.....	234,830.65
Reserve for bonuses to dealers and others.....	97,625.21
Reserve for taxes and insurance.....	49,680.45
Preferred Stock Racine Rubber Company in process of redemption against which deposit with Fort Dearborn Trust and Savings Bank, Chicago, Illinois, is carried as an asset.....	142,107.30
Capital Stock:	
Common—142,000 shares, par value \$50 per share.....	7,100,000.00
Surplus and undivided profits to Dec. 31, 1916.....	155,175.79
	\$8,629,061.21

Inter-City Match In July

Reliability Run Starts July 17 at Buffalo and Lasts for 3 Days

NEW YORK, Feb. 17—Dates for the proposed inter-city team reliability match were selected to-day at a meeting held in the office of the Contest Board of the American Automobile Assn., participated in by Chairman Kennerdell of the A. A. A. Contest Board, Robert Lee Morrell, head of the Metropolitan Consulate, A. A. A.; Samuel E. Hibben of Chicago, chairman of the Inter-City committee and C. G. Sinsabaugh, secretary. The dates chosen were July 17, 18 and 19 and it was decided to use Buffalo as the start and finish of the match, the Automobile Club of Buffalo having undertaken to act as host and to lay out the routes and make all hotel arrangements.

Teams from Ten Cities

It was decided by the meeting to limit the entry to teams from ten cities, each team to consist of from five to ten cars each. So far definite assurances of support have been received from New York, Chicago, Indianapolis, Detroit and Buffalo, while Philadelphia, Boston and Cleveland are considering the matter; so it will be seen that it will be comparatively easy to fill the entry lists. Each city must declare, by May 1, its intention to compete and must announce the make-up of its team by June 1. The complete rules which will be essentially the regulations which have governed the Chicago Inter-Club team matches for the last 10 years will be framed by a committee headed by George F. Ballou, formerly of Chicago and now of New York. These will be ready by March 1 at which time entry blanks will be sent out.

Each city will be entitled to representation on the general committee which will make the appointment and hold each representative responsible for the make-up of the team in his city. At the present time these representatives are: Chicago, S. E. Hibben; New York, Robert Lee Morrell; Indianapolis, H. H. Rice; Buffalo, D. H. Lewis; Detroit, W. S. Gilbreath. In all probability Harry W. Knights will look after the Boston team, S. Boyer Davis, Philadelphia and Fred H. Caley, Cleveland.

Hayes To Build Axles

OSHKOSH, WIS., Feb. 19—The Hayes Machine Co., Oshkosh, Wis., has developed a large department which will specialize in the manufacture of front and rear axles for motor vehicles, including trucks and tractors.

Industrial Service by N.Y. Bank

National City Bank Serves Customers with Financial and Factory Advice

NEW YORK, Feb. 20—The National City Bank has started a new department of industrial service, designed to render expert financial advice to customers. It is proposed to deal with practical, everyday problems of the factory, store, or office, and to supply the latest data on industrial problems obtained from all sources.

This new department will take in the study of the proper proportions between invested, or permanent, capital, and borrowed capital in connection with applications for loans. Too many firms, it is stated, are doing too much business for the capital invested with them, with the result that they are at the mercy of their banks when conditions curtail the supply of credit.

Rubber Men Elected Bank Officers

AKRON, Feb. 16—F. A. Seiberling, president of the Goodyear Tire & Rubber Co., was elected president of the new Ohio Savings & Trust Co. The company has just been organized by east Akron factory men whose combined payrolls amount to \$2,000,000 per month. C. W. McLaughlin, vice-president of the Mohawk Rubber Co., was elected vice-president; W. E. Palmer, assistant treasurer of the Goodyear Co., treasurer, and C. F. Ayers, secretary.

Bieling Heads Marmon Sales in Central States

INDIANAPOLIS, Feb. 16—W. M. Bieling has been appointed Central States sales manager of the Nordyke & Marmon Co., selling Marmon cars in Ohio, Indiana, Kentucky and adjacent territories. He will make his headquarters at Indianapolis.

H. H. Brooks has been appointed as-

sistant sales manager of the company in Indianapolis. Mr. Brooks is well known in the trade through his connection with the Marathon Motor Car Co., Nashville, Tenn.

Gerald Fitzgerald is now a member of the sales department of the Indianapolis company. Mr. Fitzgerald was formerly manager of the Minneapolis branch of the Remy Electric Co., and lately has been engaged in motor truck selling. Mr. Fitzgerald will do general traveling.

E. & J. Gross Income \$747,822

DETROIT, Feb. 16—The Edmunds & Jones corporation transacted for the year ending Dec. 31, 1916, gross sales amounting to \$2,829,285, from which a gross income was derived after a deduction of cost of sales of \$747,822; the general expenses were \$185,896; preferred and common dividends, \$171,625. A surplus of \$390,301 remained.

Copper and Rubber Lower

NEW YORK, Feb. 20—Copper and rubber prices featured last week's market activities. Electrolytic copper rose to 36½ cents a pound, while Lake copper reached 37½ cents. Rubber prices receded last week, possibly on account of the delay in the German submarine activity. Tin dropped \$5 per 100 lb. to \$49.50. Lead reached a record quotation yesterday, when it quoted at \$11 per 100 lb., a rise of \$1.50 for the week.

Savannah Gasoline Prices Advanced

SAVANNAH, GA., Feb. 20—The wholesale price of gasoline has been advanced from 22 cents to 23 cents, and the retail price has gone to 26 cents. Many local dealers are selling at cost, while others at an advance of 1 and 2 cents above cost.

Standard Tool Increases Capital

DETROIT, Feb. 17—The Standard Tool Mfg. Co. has increased its capital from \$35,000 to \$100,000.

Daily Market Reports for the Past Week

Material	Tues.	Wed.	Thurs.	Fri.	Sat.	Mon.	Week's Changes
Aluminum, lb.	.58	.58	.58	.58	.58	.58	...
Antimony, lb.	.30	.30	.30	.30	.30	.31	+.01
Bessemer Steel, ton.	65.00	65.00	65.00	65.00	65.00	65.00	...
Copper, Elec., lb.	.34½	.35	.35	.36½	.36½	.36½	+.02
Copper, Lake, lb.	.34½	.35	.35	.37	.37	.37	+.02½
Cottonseed Oil, bbl.	12.70	12.65	12.50	12.40	12.40	12.38	-.32
Fish Oil, Menhaden, Brown, gal.	.74	.74	.74	.74	.74	.74	...
Gasoline, Auto, bbl.	.23	.23	.23	.23	.23	.23	...
Lard Oil, prime, gal.	1.36	1.36	1.36	1.36	1.36	1.36	...
Lead, 100 lb.	9.50	9.50	9.50	10.25	10.25	11.00	+.150
Linseed Oil, gal.	.94	.94	.94	.94	.94	.94	...
Open-Hearth Steel, ton.	65.00	65.00	65.00	65.00	65.00	65.00	...
Petroleum, bbl., Kans., crude.	1.70	1.70	1.70	1.70	1.70	1.70	...
Petroleum, bbl., Pa., crude.	3.05	3.05	3.05	3.05	3.05	3.05	...
Rapeseed Oil, refined, gal.	1.00	1.00	1.00	1.00	1.00	1.00	...
Rubber, Fine Up-River, Para, lb.	.85	.85	.85	.84½	.84	.83	-.02
Rubber, Ceylon, First Latex, lb.	.91	.91	.91½	.90½	.90	.89	-.02
Sulphuric Acid, 60 Baume.	1.00	1.00	1.00	1.00	1.00	1.00	...
Tin, 100 lb.	54.50	53.50	51.00	50.00	50.00	49.50	-.50
Tire Scrap, lb.	.06½	.06½	.06½	.06½	.06½	.06½	...

Federal Truck Sales \$4,261,009

Net Profits \$680,615 Equal to
125 Per Cent on Stock—Assets Total \$1,987,723

DETROIT, Feb. 19—The Federal Motor Truck Co. in its report for the year ending Dec. 31, 1916, shows gross sales aggregating \$4,261,009.47, an increase of \$1,307,503.05 over the 1915 total of \$2,953,506.42. Net profits were \$680,615.20, equivalent to 125 per cent on the \$500,000 of outstanding capital stock, or 68 per cent on the \$1,000,000 of issued stock which the company will have after distribution of its 100 per cent stock dividend, April 2.

The balance sheet lists assets aggregating \$1,987,723.17, which compares with \$1,166,181 on Jan. 1, 1916. Quick assets total \$1,540,680.27 against \$954,845.26 at the beginning of 1916. Cash was \$121,426 against \$23,986.28, inventories \$804,164.26 against \$483,420.92 and accounts receivable \$573,496.65 against \$314,202.92.

Plant investment was \$367,457.26, comparing with \$203,156.22 a year ago and prepaid expenses amounted to \$14,937.60 compared with \$8,179.50.

Current liabilities amounted to \$493,358.99, the increase from \$228,269.44 at the end of the previous year being attributable to a larger volume of business. Bills payable were \$253,363.15 and notes payable \$200,000. At the end of 1915 bills payable were \$204,925.76. Reserve for depreciation and bad debts was \$122,263.19 increase from \$32,670.38 at the end of 1915.

Capital stock remained at \$500,000 during the year. Accumulated surplus, Dec. 31, was \$872,100.99, comparing with \$405,241.18 at the end of the year before. From the surplus at the end of 1916, \$500,000 is being transferred to capital account to compensate for the 100 per cent dividend in stock. This operation completed will leave the company surplus of about \$372,000.

Michigan Corporations Change Capital

LANSING, MICH., Feb. 16—The Field Motor Co., of Grand Rapids, has dissolved its \$100,000 corporation and has been incorporated for \$500,000. The Detroit Piston Ring Co. has been incorporated for \$100,000. The All-Season Body Co., Jackson, Mich., has been incorporated for \$500,000.

U. S. Rubber To Buy 14 Plants

NEW BRUNSWICK, N. J., Feb. 17—Fourteen subsidiary plants of the United States Rubber Co. will be taken over by the parent organization in the near future. The stockholders have

authorized a \$60,000,000 bond issue to secure direct control of these companies whose stock is already chiefly held by United States Rubber interests.

Col. Samuel P. Colt, president of the company, expects a business of \$125,000,000 will be done by the corporation this coming year, more than half of which will be in the footwear trade. The tire department, he says, is not showing much profit, due to severe competition in this product, and the prices are likely to increase again.

Doble Names First Distributors

DETROIT, Feb. 18—Announcement of the first distributors for the Doble car has been made by the General Engineering Co. The Pacific Kissel Car Co. will handle the automobile for California, Oregon, Washington, Nevada, Arizona and Hawaii. The E. C. Thompson Co. will distribute in Minnesota, the Dakotas, Montana east of the Rockies and the western half of Wisconsin.

Woodside Studebaker Plant Supt.

DETROIT, Feb. 19—W. P. Woodside has been appointed superintendent of plant 4, of the Studebaker Corp.

Lumpkin Is Silvex Advertising Manager

SOUTH BETHLEHEM, PA., Feb. 16—Walter H. Lumpkin has been placed in charge of the national advertising campaign on Bethlehem spark plugs. He was made advertising manager for the Bethlehem products at a recent meeting of the Silvex Co. He has been associated with the selling department of the company for several years.

Motor Issues Are Stronger

Fisher Body Features Activities with 20-Point Gain—Tire Issues Active

NEW YORK, Feb. 20—Strength in all of the industrial stocks was reflected in the automobile securities last week. Yesterday the issues picked up considerably despite the weakness in Bethlehem Steel, which has more or less of a potent effect on the trend of security prices.

Fisher Body preferred featured the activities last week by registering a gain of 20 points, reaching 110. Fisk Rubber common was strong and also a feature with a rise of 15 points. Maxwell issues were active as were General Motors, Chevrolet, United Motors, Saxon and Willys-Overland.

White and Continental Motors were active on account of rumors of dividend action. An increase in the White Motor dividend to a 10 per cent basis next quarter is being discussed in Wall Street. The meeting takes place early in March. Continental Motors, it is stated, will place the common stock upon a regular dividend basis about April 1.

General Motors common stockholders, it is stated, will be treated to a substantial increase in the dividend this April, because nearly all the old stock has been exchanged. The initial payment of \$1 a share last month was no indication of what the regular rate was to be when

the transition in corporate form is effected. It is probable that the coming declaration will be at least 1½ per cent and possibly 1¾ per cent. General Motors is earning a 6 per cent or 7 per cent regular rate at least five times over.

Amazon Rubber Co. Incorporated.

AKRON, Feb. 16—The Amazon Rubber Co. has been incorporated under the laws of Ohio for \$500,000. L. J. Schott, president of the Amazon Tire & Rubber Co., states that the new company is formed for the purpose of buying out the older concern, and will operate and enlarge the present plant.

National Tire Incorporates for \$1,000,000

EAST PALESTINE, OHIO, Feb. 17—The National Tire & Rubber Co. has been incorporated for \$1,000,000 to manufacture tires and tubes. Incorporators are: R. E. Waldo, H. A. Clark, H. B. Callahan, V. A. Sturgeon and H. C. Johnston.

To Exhibit Universal Valveless Engine

MUSKEGON, MICH., Feb. 16—One of the new valveless engines manufactured by the Universal Valveless Motor Co., of this city, will be exhibited at the Grand Rapids Automobile Show Feb. 19-24.

Minnesota May Raise Fees

ST. PAUL, MINN., Feb. 17—Much automobile legislation is before the Minnesota legislature at its bi-yearly session. Bills have been introduced to raise the automobile registration fee to \$5 a year,

Automobile Securities Quotations on the New York and Detroit Exchange

	Bid	Asked	Net Ch'ge
*Ajax Rubber Co.	69	70	..
J. I. Case T. M. Co., pfd.	82	85	..
Chalmers Motor Co., com.	25	30	..
Chalmers Motor Co., pfd.	..	..	..
*Chandler Motor Car Co.	96	98½	+ ½
Chevrolet Motor Co.	102	107	+ 7
Fisher Body Corp., com.	35	40	..
Fisher Body Corp., pfd.	110	120	+ 20
Fisk Rubber Co., com.	75	85	+ 15
Fish Rubber Co., 1st pfd.	101	105	..
Fisk Rubber Co., 2nd pfd.	95	102	..
Firestone Tire & Rubber Co., com.	136	138	—4
Firestone Tire & Rubber Co., pfd.	107	107	—1
*General Motors Co., com.	108	108½	+ 3½
*General Motors Co., pfd.	88½	89	—½
*B. F. Goodrich Co., com.	56½	57½	+ 1½
*B. F. Goodrich Co., pfd.	109	110½	—½
Goodyear Tire & Rubber Co., com.	254	258	—16
Goodyear Tire & Rubber Co., pfd.	106½	107½	— ½
Grant Motor Car Corp.	5	7	+ 1
Hupp Motor Car Corp., com.	6	8	+ 2
Hupp Motor Car Corp., pfd.	15	17	..
International Motor Co., com.	..	70	..
International Motor Co., 1st pfd.	..	30	..
International Motor Co., 2nd pfd.	..	54½	58
*Kelly-Springfield Tire Co., com.	90	93	+ 2
*Kelly-Springfield Tire Co., 1st pfd.	20½	22	..
*Lee Rubber & Tire Corp.	55	55½	+ 4
*Maxwell Motor Co., Inc., com.	68	69	+ 1¼
*Maxwell Motor Co., Inc., 1st pfd.	34½	35½	+ ¼
*Maxwell Motor Co., Inc., 2nd pfd.	250	254	+ 5
Miller Rubber Co., com.	105	107	— ¼
Packard Motor Car Co., com.	..	150	..
Packard Motor Car Co., pfd.	..	102	..
Paige-Detroit Motor Car Co.	38½	39½	+ ½
Peerless Truck & Motor Corp.	14	18	+ 2
Portage Rubber Co., com.	162	165	..
Portage Rubber Co., pfd.	..	..	..
Regal Motor Car Co., pfd.	27	33	..
Reo Motor Car Co.	36½	37½	..
*Saxon Motor Car Corp.	52	54	+ 5
Springfield Body Corp., com.	70	80	..

*At close Feb. 19, 1917. Listed N. Y. Stock Exchange.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

	Bid	Asked	Net Ch'ge
ACTIVE STOCKS			
Auto Body Co.	..	33½	..
Chalmers Motor Co., com.	128	..	..
Chalmers Motor Co., pfd.	6½	6½	..
Continental Motor Co., com.	9½	9½	— ½
Continental Motor Co., pfd.	98	99	..
Ford Motor Co. of Canada	..	255	..
General Motors Co., com.	..	..	..
General Motors Co., pfd.	..	..	..
Maxwell Motor Co., com.	..	..	..
Maxwell Motor Co., 1st pfd.	..	..	..
Maxwell Motor Co., 2nd pfd.	..	..	..
Packard Motor Car Co., com.	..	..	..
Packard Motor Car Co., pfd.	100½	101½	..
Paige-Detroit Motor Car Co.	38½	39	+ 1½
W. K. Prudden Co.	50½	50½	..
Reo Motor Car Co.	36½	36½	+ ½
Studebaker Corp., com.	..	..	..
Studebaker Corp., pfd.	..	..	..
C. M. Hall Lamp Co.	..	32	..
INACTIVE STOCKS			
Atlas Drop Forge Co.	38	..	..
Kelsey Wheel Co.	27	33	..
Regal Motor Car Co., pfd.	..	..	..

deprive drivers convicted of intoxication while driving of license for 3 months, to make it a felony to steal a car, to make possession of automobiles with altered factory numbers *prima facie* evidence of theft, a tax of 25 cents per horsepower and 25 cents per 100 lb. on motor vehicles, to be in lieu of other taxes on the vehicles.

A dimmer bill has been offered prohibiting use of lights which project more than 3 feet above the surface of the road 75 ft. ahead of the car, exempting fire apparatus and publicly-owned vehicles, and providing for examination of lights by county sheriffs and a fee of 25 cents for certificate of examination.

Another bill is planned to compel all vehicles to carry lights at night. A second will permit county commissioners to compel installation of safety signals at dangerous railroad crossings, and a third to prohibit manufacture of sleighs other than those 56 in. of width at the runners.

\$2,000 Bond for Pennsylvania Owners and Operators

YORK, PA., Feb. 17—A bill is being prepared which will require every owner of an automobile or motor truck to file a \$2,000 bond when he applies to the State Highway Department for a license, operators and chauffeurs being required to do the same thing. The bond would be used for the benefit of any person obtaining judgment for injury caused by the automobile.

Among the revenue raising legislation being discussed is the measure for a new minimum automobile license of \$12. The present minimum is now \$5. It is estimated that the new minimum of \$12 would add to least \$750,000 to the State revenues.

Pennsylvania's receipts from automobile licenses this year have aggregated \$1,625,000, which is more than \$425,000 more than received up until this time in 1916. The total receipts during last year were \$2,325,000 in round numbers. Thus far there have been 136,500 pneumatic tire cars licensed and 10,560 solid tired machines or trucks. Last year there were 11,732 solid tired machines licensed.

Dealers' Service Bureau in California

SAN FRANCISCO, Feb. 17—The Motor Car Dealers' Service Bureau of California has been established and has opened offices at 1111 Post Street. The bureau will operate in practically any capacity for Pacific Coast dealers; will furnish lists of cars sold, assist in obtaining distributors and dealers, handle adjustments, claims, legal matters and collections, secure signatures to contracts, handle advertising and publicity, secure parts and close contracts, etc.

St. Louis Factories on Peace Basis

Car Sales Expected to Double in 1917—Truck Sales to Gain 200 Per Cent

ST. LOUIS, Feb. 17—St. Louis factories for the past 2 years have been on a peace basis. They have not taken war orders in any large quantities and therefore do not expect any business slump when the war is over. With the prospect of uninterrupted prosperity the dealers here predict that the automobile business will gain 100 per cent in 1916 over 1917. The truck sales are expected to go up 200 per cent.

The state department is prepared to issue 150,000 licenses this year. So it would appear that others share the dealers' optimism when they place Missouri sales at 50,000 vehicles. If Missouri buys 50,000 vehicles this year, St. Louis should sell, wholesale and retail, 65,000, a new vehicles business of \$45,000,000.

St. Louis is a merchandising city. Eugene Smith, secretary of the Merchants Exchange, through which grains and other farm products are sold, is the official statistician of the city. He gives these figures for the 1915 jobbing business in several lines: Drygoods, \$75,000,000; groceries, \$65,000,000; boots and shoes, \$55,000,000; lumber, \$40,000,000; woodenware products, \$20,000,000; electric industries, \$18,000,000; soaps and candles, \$16,600,000; tobacco and cigars, \$55,000,000; hardware, \$50,000,000; automobiles, vehicles, farm implements, \$20,000,000.

Mr. Smith's figures for 1916 have not all been tabulated but he says that the increase will not be less than 30 per cent over 1915.

Bank clearings for the past 3 years were:

1914	.....	\$3,888,851,608
1915	.....	4,153,529,336
1916	.....	5,370,977,392
Jan., 1916	.....	\$429,456,675
Jan., 1917	.....	590,495,304

The prosperity of the workers in this community always is reflected in the shoe making business. Probably 60 per cent of the shoe trade here is home manufactured. Three factories showed a total increase of \$2,794,867 in business in the past year.

Beer is another prominent industry and it amounts to about \$35,000,000, out of which more than 7000 persons get a living wage. Comparatively new industries here are in heavy cast iron machinery, which is growing into a good total. The electric manufacturing business is going ahead rapidly. It was hampered for some years because two of

the largest concerns were tangled in patent litigation, which is settled and they are forging ahead.

Also the automobile equipment business is employing a constantly increasing number. This includes two new tire concerns, a number of body factories, the outgrowth of the old buggy making business, and some specialty factories. The building campaign for the year is set for heavy increases by reason of a school building campaign for which \$3,000,000 in bonds have been voted and contracts already let for office buildings.

The tonnage in 1915 was: tons received, 30,684,935; tons shipped, 22,252,181. Secretary Smith says that 1916 will show an increase of more than 15 per cent, according to figures that include railroads in all directions but not all roads.

The nearby country is largely agricultural. Last year was the most prosperous, by reason of selling prices, ever recorded. The planting of winter wheat has been 10 per cent greater. At this time the prospect is good except for moisture and it is too early to worry about that. The Illinois coal mines are working to capacity at high prices and the Missouri lumber and zinc and lead regions are enjoying excellent prosperity. The only drawback is a lack of labor.

Truck Field Grows

As to trucks: The dealers say that the factories are keyed up to high production because of war orders and now must find a new field. So they are going to increase the selling power in U. S. agencies. The opening of a free bridge across the Mississippi has opened a vast field. Previously the cheapest toll across the river for an automobile was 70 cents a round trip. Heavy vehicles cost more. As a result the merchants would wait until the freight cars were brought across, even when switching tonnage was charged and terminal blockades delayed shipments. Now coal and other firms are negotiating for trucks to haul much of this freight across the free bridge, built by the city. One coal firm is negotiating with a local truck dealer for a dozen of his highest priced trucks and a larger fleet of trailers.

The Allies have bought 230,000 horses through the East St. Louis horse and mule market since the war began and have paid more than \$42,000,000 for them, an average of about \$190 per animal. Thus the sale of a team provides money for an automobile, and gasoline is cheaper than hay at present prices. Anyway, feed brings more profit fed to a growing colt or calf which is sold at the end of the growing season than when fed to an adult animal. This has provided farmers with means to buy automobiles.

About St. Louis in a general way, remember that it is:

The fourth city.

That 825,000 people live in the city and 1,000,000 in the immediate trade district and 40,000,000 people within 500 miles.

That this was the only city of size that has not had a freight embargo declared against it this winter and this fact is proving attractive to many large manufacturing concerns who are establishing assembly plants and branch factories here.

That St. Louis manufacturers did not get excited over munition orders. This city did as little business along this line as any city of importance and most of the factories that did take contracts have gotten out from under and now have their employees working in other lines. The shoe dealers refused to make army shoes but are overwhelmed now with orders for civilian shoes for warring countries. The electrical concerns and a few foundries took some orders, but have completed them and have taken up other lines without loss of working force. About the only lines continued are dun stock factories and these have prepared for the future.

To Mobilize Women Motorists

ATLANTIC CITY, N. J., Feb. 16—American women are being prepared to care for the transportation facilities of the country in the event of war by the National League for Women's Service of New York, and by the first division, Women Motor Drivers' League, Atlantic City, N. J.

The aim of the societies is to train women so that they may take the place of men in motor bus or street car lines, or so that they may run ammunition, food, ambulance or relief cars in actual fighting territory. In case of invasion these forces would be used to carry the women and children from the invaded territory.

Mrs. I. Wolcott Thomas, 27 East Sixty-second Street, New York, is chairman of the motor division of the National League, and has started a class for women drivers at the West Side Y. W. C. A. Mrs. Mary Walker Harper, Atlantic City, is the organizer of the Women Motor Drivers' League. She hopes to put the league on a nationwide basis, and has offered its services to Governor Edge of New Jersey and President Wilson. The first division, Atlantic City, meets from time to time in the Hotel Warwick.

Double Seal Valve Co. Moves

NEW YORK, Feb. 19—The Double Seal Tire Valve Co. has moved from this city to 139 Beaubein Street, Detroit.

14,000 1916 Cars in Kentucky

Buyers Form Bulk of Attendance at Louisville Show—Territory Prosperous

LOUISVILLE, Ky., Feb. 17—Attendance at the Louisville show, held in the Jefferson County Armory during the past week, was made up of buyers rather than sightseers. There were forty-seven makes of cars displayed, of which thirty-one were gasoline passenger automobiles, three electrics and thirteen gasoline trucks. There were about a dozen accessory exhibits.

Business Is Better

Business in Louisville is far better than it was at this time last year. A conservative estimate based on interviews with dealers shows an increase of about 50 per cent so far this year over the same period in 1916. A few agents declare business is 75 per cent better, but this is the exception rather than the rule.

The automobile in Kentucky experienced its most prosperous year in 1916. The actual increase in registration was 12,000 for the year. The sales of new cars probably reached the total of 14,000.

Of these 14,000 new cars about 80 per cent were cars priced under \$1,000, many of them under \$500.

There is every indication that the collections for 1917 will run to \$275,000, as the same proportion of increase would give a total of 50,000 cars.

The estimated population of metropolitan Louisville to-day is 325,000; within a 20-mile radius, 400,000. The city is the largest exporting center in the world for tobacco and whiskies. It is the largest grain market in the country outside of Chicago, as well as the largest livestock market. Louisville also is the principal mahogany market and manufacturing center in America. Other great industries here are: agricultural implements, porcelain-lined bathtubs, paints, varnishes, cement, chewing gum, cottonseed oil, cottonseed oil products, organs, hardware, boxes, barrels, stoves, millinery, window shades and loose-leaf ledger supplies.

Totaling nearly \$1,000,000,000, an increase approximately of \$200,000,000 over 1915, the previous best mark, bank clearings in Louisville for the past year reached the highest figure in the city's history.

With the exception of 1914, when there was a decrease of nearly \$50,000,000, Louisville clearings have steadily increased since 1908, the year following the panic. Louisville's progress has been

rapid and substantial, and to-day the city's exchanges are in greater volume than a number of other cities of equal size or larger, including Indianapolis, Buffalo, St. Paul, Seattle, Denver, Providence, Columbus and Toledo.

Kentucky, with a gross area of 40,598 square miles, had a population of 2,386,866 on Jan. 1, 1917. There is only one automobile for every seventy-five persons in the Bluegrass State to-day, which indicates what immense possibilities Kentucky holds for the sales organizations of the automobile factories.

The principal crops of Kentucky in 1916 possessed a farm value of approximately \$187,531,590, an increase of \$58,267,000 over 1915. An increase of more than \$4,000,000 in whisky tax during the calendar year 1916 over the preceding year brought the grand total of internal revenue collections for the same period to a new record in the fifth district of Kentucky.

Leaf tobacco is bringing the highest prices in more than 10 years. According to the United States Department of Agriculture, Kentucky raised 435,600,000 lb. of tobacco in 1916, with an average farm value on Dec. 1 of 12.7 cents a pound or a total value of \$55,321,200. The crop of 1915 was estimated at 356,400,000 lb., and the average farm value on Dec. 1, 1915, was 7.8 cents a pound, making the total value of the crop \$27,889,200. Thus it may be seen that the crop of 1916, although only 79,200,000 lb. larger than that of 1915, had a value twice as great.

The corn crop was worth \$82,824,000, as compared with \$58,000,000 for 1915. Besides, the supply of live stock and its value and minor farm products rank far above those of 1915. Thus it may be seen that this territory is in possession of a tremendous buying power, and its business pursuits are less susceptible to the effects of the great war than those of many other parts of the country.

Hess-Bright Opens Two Branches

NEW YORK, Feb. 16—The Hess-Bright Manufacturing Co. has opened two branch sales offices—one for the eastern portion of the country at 1974 Broadway, New York, and one for the central section at 1036 Guardian Building, Cleveland. H. E. Brunner is in charge of the New York office and is assisted by H. A. Fonda. The Cleveland office is under the direction of R. E. Clingan, assisted by Walter Rippie and M. S. McNay.

Swedish Hupmobile Dealer in Detroit

DETROIT, Feb. 16—Seth A. Hoagmann, dealer in Sweden for the Hupmobile, is in Detroit. Mr. Hoagmann's headquarters in Sweden are Stockholm.

Kansas City Tractor Show Breaks All Records

Bigger and Better Than Last Year's Show—S. A. E. Holds Banquet and Discusses Tractor Design—Construction Generally Improved—35,000 to 45,000 Machines Built in 1916

KANSAS CITY, Feb. 17—The tractor show is much bigger and in every way much better than that held a year ago. There is good reason to regard Kansas City as the natural center for a National tractor show, just as New York and Chicago are centers for automobile exhibitions. Great credit belongs to the K. C. Tractor Club, which organized last year's show and improved upon it this year. Composed mainly of dealers, it is none the less a body well qualified to talk tractor engineering, having a large share in the fund of available experience.

Simultaneously with the show the S. A. E. descended upon Kansas City and held a banquet on Feb. 14 at which over 160 tractor men were present. Talk centered upon the subject of standardization, prominent among the speakers being H. L. Horning, who has just been made chairman of the newly appointed tractor division of the standards committee. Tractor design is consolidating fast and it needs its standards to grow up with it; and tractor makers are ready and eager for the standards.

Tractors have improved astonishingly in the past year, in fact, it appears that some definite line of development can now be tracted. A year ago tractor design was quite haphazard; there was no definite design that the buyer felt certain of. To-day the corner has been turned, and it is generally conceded that tractor design has started forward on a more definite line. There are in the show several old style machines built by the biggest makers, but it has been generally whispered that these big makers have in their experimental shops the new machines that correspond with the more advanced thought of tractor design. Two or three big companies, it is understood, are keeping such quiet until they are ready to bring out their new models.

1916 a Big Year

Last year was a big year in tractordom. The makers started out to build 50,000 tractors, but they did not reach the mark. The output ranged somewhere between 35,000 and 45,000 machines. Nobody seems to know exactly where, but all agree that the 50,000 total was not reached. For 1917 the makers are talking of 100,000 machines, but here again the conservatives claim that 70,000 will be the possible limit of the year.

The general consensus of opinion is that the four-cylinder vertical engine will

dominate the field, with a few six-cylinders perhaps for exceptionally large jobs. At present some large production concerns are marketing the horizontal two-cylinder design, but sentiment is that they are already over the fence and prepared to bring out vertical jobs. The vertical motor is placed longitudinally between the front wheels, much as in a truck or car.

To-day the four-wheel tractor gives evidence of also dominating the situation, but this path of development is not nearly so clearly defined as that of the vertical engine. There is more or less of an argument between the four-wheel designs and those using three wheels with a single wheel for steering in front. Both use practically the same arrangement of engine, clutch and power transmission with the two driving wheels in the rear. Those using the single wheel in front argue that they can turn in less space, which is very essential in farming; the four-wheel exponents argue that there is not sufficient weight on the single front wheel for correct steering at all times, and further than the three-wheel design is not so well suited for road work as the four-wheel.

There is very general agreement that two driving wheels are needed at the rear and that those designs using only one rear driving wheel are bound to go sooner or later. The argument is advanced that they upset too easily and that there is not enough weight on the steering wheel or wheels.

One of the biggest changes that came over the tractor industry last year was the more general use of kerosene and also the filtering of air entering the carburetor.

Heavy Fuel Necessary

Of just as great importance as filters has been the more general use of a fuel a little heavier than gasoline. The farmers call it kerosene but it is generally a fifty-fifty mixture of gasoline and kerosene. It is hard to sell a tractor to-day unless it will use kerosene. A year ago there was no such demand. Then gasoline was relatively cheap, but the increase in price has quite changed the farmer's attitude. Now he demands kerosene whether he uses it or not. The tractor makers and the carburetor makers have risen to the occasion and provided devices that will handle kerosene, but even this is no assurance that such is being

used. The opinion is very general that very few farmers are using pure kerosene, but that most of them are mixing it with gasoline.

Engine makers have met many obstructions in refining their motors for tractor work using kerosene. They have found much pre-ignition which has resulted in a complete redesign of the combustion chamber so as to rid it of all hot spots which might lead to pre-ignition. This has been no small job, in short, has been a real engineer's task. Spark plugs have given trouble, but it has generally been remedied by better waterjacketing. The trouble of kerosene working into the lubricant in the crankcase has been largely overcome by better piston and ring fitting. The net result is that the tractor has had a very great influence on the automobile and the truck, and we are getting better car and truck engines.

There are many other ways in which farm tractors are being improved. The gearsets are vastly superior to a year ago, and now the rule is to inclose every part of a tractor as well as and better than on a car.

Tractor Rating Unsettled

There are many unsettled points in tractor development and one of the major ones is tractor rating. In the early days of motor car design we adopted what was known as a horsepower rating equation, which has been generally used ever since, but which has not proved very satisfactory, and can scarcely have been called a complete success. In the tractor field they have what is known as a rating which includes draw bar and belt power, each tractor having a large pulley for belt drive, as often 50 per cent of a tractor's work is driving machinery by means of its belt. At present these ratings are too variable and already the makers have set to work to settle upon some standard system, so that all will talk in the same terms on this subject.

As to the eventual type of tractor little can be said, excepting commenting on the general statement that many think the eventual tractor will have to combine work on the farm with work on the road a little better than it does to-day. The tractors are generally designed to plow, harrow, draw binders, moving machines, seed drills, harrows and other tools for soil cultivation. But the farmer must transport his grains to the depot, and must do many other road jobs. One trac-

tor maker with this in mind has designed a machine with five wheels, two steering wheels in front and three wheels in a row at the back. The center back wheel is a very wide one for work in the fields, and at either side is a narrow wheel. In less than an hour the broad center wheel can be removed and wood tires fitted to the two outside wheels, thereby giving a very good machine for road work, with speeds claimed as high as 5 or 6 m.p.h., relatively high compared with speeds of 2 or 3 miles as needed in plowing.

Nobody feels very certain on this question of a combined machine for soil cultivation and road work. The farmer has bought his automobile, which often costs him as much as a tractor, and it is assumed that he will soon buy a truck, which should care for all transportation work. This would leave the question of tractor design solely up to that for soil cultivation with the necessary belt drive for running farm machines. With such an avalanche of converting devices for Fords, Overlands, Buicks, Studebakers and Dodges making them into light trucks, it will not be surprising to see these in very general use, and doing their part to powerize the farm.

One tractor maker has developed a two-wheel design which occupies a similar position to that of the tractor used in the truck field, which is a very short four-wheel machine designed to have the front end of the trailer carried on it. In the farm tractor field this maker has a two-wheel machine incorporating the engine, transmission and everything that goes with it. This two-wheeler can be hitched in front of a mowing machine, a binder, a set of plows or any other farm implement.

Starr Leaves Overland to Go with Leavitt

LOS ANGELES, CAL., Feb. 17—L. V. Starr, manager of the Overland branch here, has resigned after 6 years' connection with the company. O. B. Henderson has been named as acting manager. Mr. Starr joins J. W. Leavitt & Co., former Overland distributor in California, whose interests were purchased by the Willys-Overland Co. for \$1,000,000, as vice-president and one of the directors. Mr. Starr will be in charge of affairs in the southern half of the State, and A. D. Plughoff, another vice-president and director will be in charge in the north.

U-S-L Changes

NIAGARA FALLS, N. Y., Feb. 15—J. A. White, formerly manager of the Boston and Chicago branch offices of the U. S. Light & Heat Corp., has been appointed manager of sales of the battery department with offices in this city.

W. W. Halsey has been appointed manager of the New York sales office.

Dealers in Kansas City Territory Need Cars and Trucks

Many Sales at Kansas City Show—Territory Will Need 80,000 to 90,000 Cars in 1917—Zinc, Oil and Agricultural Outputs Render People Prosperous

KANSAS CITY, Mo., Feb. 17—It is what the dealers can get—not what they could sell—that governs automobile buying in Kansas, Oklahoma and Missouri this year. A conservative estimate gives an increase of \$30,000,000 in business and this increase is based on what cars the factories have agreed to ship into this territory and not what the dealers could sell. Of over 100 dealers interviewed from all parts of this great country over 90 per cent made the statement that they would sell all the cars the factory would ship them and bemoaned the fact that their contracts were limited.

At the Kansas City automobile show which closed Saturday, a total of 204 cars and 44 trucks was exhibited. This was by far the finest show ever held in the Southwest and it could compare with the Chicago show both in magnitude and in the amount of business done. There was a gate attendance of over 140,000 people during the week and all records for outright buying and for placing of dealers were surpassed.

Unofficial figures place the attendance for the Kansas City show at 195,000; this is one-third greater than last year. The total number of dealers registered to date is 3300. It is estimated that 6500 dealers from out of town will register before the show closes.

It seems certain that Kansas, which added 30,000 automobiles to its registration last year, in the 12 months ending July 1, and which had 114,373 automobiles licensed on Jan. 1 this year, will want at least 50,000 more cars in 1917. Kansas will also take probably as many trucks as it can get.

Oklahoma, which gained 27,588 automobiles in 1916, or 116 per cent, and now has 52,239 registered, probably will buy 30,000 or 40,000 this year, maybe more—for it is said that most of the cars last year were sold to farmers, the cities not yet having made a corresponding increase.

102,000 Cars Needed

Missouri, which registered 103,587 cars in 1916, a gain of 31,000 over 1915, has already registered 69,143 in 1917, indicating a possible total for the year of around 140,000. In the Western half of the State, the 1916 registration was 58,035—the territory to which Kansas City distributes—so that it seems safe to mention 22,000 cars as the possible distribution from Kansas City to Missouri this year.

To keep to the exact figures of these guesses, this means about 102,000 cars—not counting trucks—which may be estimated as the distribution from Kansas City to its immediate territory; with good conditions, the number is likely to be largely increased in Kansas and Oklahoma, possibly to 130,000. Serious setbacks in agriculture, live stock or oil might reduce the total to 80,000 or 90,000 in the three States.

Surprisingly, the vast growth of the industry in this territory is thriving at this moment in the face of a rather poor prospect for the 1917 wheat crop, increased cost of cars and increased cost of living. Then why all the prosperity? People are buying now because the 1916 crop was a record breaker. The fortunes accumulated from this year of prosperity were not all spent. Moreover the people of the community are looking at a possible poor 1917 crop season as a fitting time to prepare themselves for another record breaker in 1918 and they are buying trucks and cars for two things. One is to give them the necessary motor equipment for intensified farming, the other is to give them comfortable passenger cars for business use in getting to and from the city and to give a hard working family its hours of pleasure.

The zinc and lead mining district of Missouri, Kansas and Oklahoma produced 34 per cent more in 1916 than 1915, or \$10,000,000, and the past year was a banner year in production, value and expansion of operations. The Joplin district and other larger centers are promising fields not only for automobiles, but for trucks—and there seems an especially interesting prospect for electric vehicles.

There figures into the new prospective wealth startling discoveries of vast quantities of oil under Kansas. The State is being drilled in practically every section and already there are producing wells which are making land owners rich. The oil boom is the talk of the territory and perhaps every third person is an investor in oil stocks. Furthermore, most of this invested money goes back into the development of the wells, purchase of supplies and all channels which tend toward rapid growth of the business. The United States geographical survey gives the following figures for Kansas oil production:

In 1909, 1,263,764 bbl.; 1910, 1,128,668 bbl.; 1911, 1,278,819 bbl.; 1912, 1,592,796

bbl.; 1913, 2,375,029 bbl.; 1914, 3,103,385 bbl.; 1915, 2,823,487 bbl. This is a total of 28,074,071 bbl. The estimated future production of 40,000,000 bbl. has been entirely abandoned due to the recent discoveries of vast new fields.

Grain and Stock Raising

Kansas City territory is primarily a grain and stock raising territory. Furthermore there is a great acreage suitable for farming which is still undeveloped. In districts where rainfall is slight and winds are high and frequent, it is now being realized that mechanical tilling of the soil by use of tractors will permit of exceedingly profitable crops, therefore, in another year or two we will find in this territory not only intensified mechanical farming on farms already developed, but we will find the opening up of great new fields. The values of the 1915 and 1916 crops in Kansas, Oklahoma and Missouri are as follows:

State	1916	1915
Kansas	\$314,453,000	\$260,517,000
Oklahoma	223,723,000	171,774,000
Missouri	260,049,000	239,399,000

There are your figures for that bumper year. Kansas value has increased over \$53,000,000, Oklahoma over \$51,000,000 and Missouri over \$20,000,000. There is little wonder that the farmers are willing to spend some of this money on cars.

Looking on the worst side of it first, let it be mentioned that Missouri's gain was largely brought about by unprecedented high prices. There is less possibility in this State, as its acreage already cultivated takes in about all the available farm ground, however, the eastern part of the State has had bad corn seasons for 2 years.

Kansas has an increased acreage of 2 8/10 per cent in the winter wheat this year or a total of 8,887,000 acres. There has been a shortage of moisture and the excessive winds help to blow what little moisture there was out of the soil so that the crop loss this year is going to be in the neighborhood of \$30,000,000 from present indications. However, this may be considerably decreased by planting other crops on the same ground. It is claimed that practically all of this loss could have been done away with had the farms been tractor instead of horse equipped. The proper time for plowing last summer was during a spell of excessive heat when it was not humane to take the horses out of the barn. Because of this fact the crop was plowed late and at an unfavorable time.

Corn and hay must be considered in connection with live stock and the 1916 year live stock growing in the Kansas City territory was almost unbelievably large. In fact while the production was increased well over normal, the profits were abetted by the highest prices ever seen from all classes from prime fed to

stockers. Receipts of cattle last year were 2,177,468 head against 1,860,235 in 1915. Furthermore January, 1917, prices exceed the levels of the same month of a year ago.

Comparison of prices the first week of February with the same week in 1916 shows about 30 per cent increase all down the line. While commission men had feared a slump in the receipts in the first 6 months of 1916, the arrivals are still holding up and every beef animal sells from \$15 to \$35 per hundred more than a year ago.

Last year gave another record in sheep as to the total money paid although the total production was lower. Receipts of hogs were nearly half a million larger than in 1915 with a total of 2,978,933; and prices rising nearly \$4 per hundred during the year. The prices of hogs on the Kansas City market this month reached nearly \$1,250 against \$830 of a year ago, or \$9 to \$12 apiece more for the hogs coming now.

The government reports a loss of $\frac{1}{2}$ of 1 per cent in the hog crop this year. Official figures on the hog crop population of Kansas, Oklahoma and Missouri are:

State	Jan. 1, 1917	Jan. 1, 1916
Kansas	2,535,000	2,815,000
Oklahoma	1,372,000	1,491,000
Missouri	4,280,000	4,505,000

Freight Car Shortage Felt

The Southwest is feeling the effects of the freight car situation fully as strongly as any other section of the country. Out here it is attributed more to the fact that the railroads cannot supply locomotives to get the cars to them even more than to the shortage of cars. Several dealers in Kansas City are already making plans to drive cars through from Detroit factories. So great is the demand that they will take cars completely disassembled and build them up at their own expense.

S. A. E. to Push Standardization of Tractors

KANSAS CITY, Mo., Feb. 14—Tractor standardization was put on the S. A. E. map here to-day when the Society of Automotive Engineers staged a dinner which 162 representatives of the tractor interests attended. It was a fitting time to start such work as the second annual tractor show is being attended by all of the biggest tractor builders in the country.

H. L. Horning chairman of the tractor division of the standards committee held the first meeting of his tractor division in this city and at once decided on twelve lines of standard work connected with tractors. Here they are:

1—Standardizing tractor rating just as the S. A. E. rating applied to horse-power. At present there is no uniformity

in tractor rating scarcely any two using similar ratings.

2—Standardizing tractor specifications the same as the National Automobile Chamber of Commerce has settled on certain specifications of automobiles in its year book.

3—Standardizing impulse starters for magnetos, so that the same impulse starter can be fitted in different makes of magnetos. The magneto is practically universal for tractor ignition and the impulse starter is in much demand.

4—Standardizing the height of drawbar for attaching plows or other apparatus used on farms.

5—Standardizing tractor speeds. At present tractors travel at different speeds but it is deemed essential because of plowing to have a standard tractor speed for such work.

6—Standardizing width and diameter of tractor pulleys for belt drive. As often 50 per cent of a tractor's work is belt drive, this feature is important.

7—Standardizing drawbar connections so that no difficulties will arise when attaching different loads.

8—Standardizing magneto couplings for tractors.

9—Perhaps extending flange sizes for carburetor attachments.

10—Endeavoring to reduce the number of diameters for bolts and nuts in tractor use.

11—Standardizing motor fans and fan capacities.

12—Doing something to adopt recommended practice with regard to connecting-rods for tractor motors.

Among those present at the meeting were: Fred Glover of the Emerson-Branting Co., Rockford, Ill.; F. E. Eason of Hyatt Roller Bearing Co.; E. R. Grier, tractor engineer of Oklahoma City and Herbert Chase of the S. A. E., New York. Chairman Horning is writing all tractor makers regarding standardization work. The present committee will be enlarged as soon as the work gets under way. Tractor engineers will be added.

Southern Chevrolet Opens in March

DETROIT, Feb. 19—The plant of the Chevrolet Motor Co., at Fort Worth, Tex., will commence operations in March. The Chevrolet Co. expects to produce a total of 540 cars a day by that time, its daily output now being 400 cars. The schedule now outlined calls for 600 cars a day by July 1.

Fisher Tool Holds Meeting

DETROIT, Feb. 19—The Fisher Tool & Supply Co. held its regular annual meeting last week and elected Roy Fisher president, Ralph Hoagland, vice-president, and sales manager; and Herman Fisher, secretary and treasurer.

The AUTOMOBILE

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The Competition for Labor

THE past 3 years have completely upset the industrial world. In 1914, employers were burdened with a surplus of workers and suffered from a famine of business. They were engaged in a keen competition for orders and in common enjoyed a sufficiency of labor.

To-day, the situation is reversed. Business with its unprecedented prosperity has eliminated the rivalry for orders—every factory is operating to capacity—but employers now suffer a famine of labor. They are forced to compete for workers.

This condition is an important factor in the existing alarming labor turnover. Workers, realizing that positions may be had for the asking, are changing jobs daily as the various manufacturers offer increased advantages in the form of high wages, welfare systems or profit-sharing plans.

Need for Successful Plan

These inducements work well for the company offering the most. They are extremely injurious to every other concern in the community. And none of these plans devised to catch the worker and reduce the turnover, has actually been successful, sound or substantial in its entirety.

That company which in its experiments enters into a high-wage or profit-sharing scheme will eventually encounter difficulties. The company cannot always continue the high wage or grant the huge

share of profits and will find its employees drifting away dissatisfied, discontented and sullen because having once been taught a fairly high living standard, they must again lower it when the incomes decrease.

Ford Plan and Competition

In addition, these schemes are only palliative. They are too much like the medicine that temporarily reduces fever, but has no important effect on the disease that produces it. For example, the Ford Motor Co. has succeeded in reducing labor turnover. It has granted a high wage in the form of profits that has attracted workers. And for the time being the plan may be considered successful though its cost is very high. But imagine the result if every automobile maker in Detroit offered similar wages and advantages. The effect would again be a competition for labor—on an equal basis—at an unreasonable cost plus the same high percentages of turnover as exist now.

When some large employer discovers a plan for retaining workers and for making them content, that will possess the same benefits though all employers adopt it, he will have succeeded in solving a problem that now confronts every manufacturer.

Electric Prices

THERE are two diametrically opposed ideas on the proper field of the electric. One class is represented by those who say that it is impossible to sell a low-priced electric and the other by the manufacturers who are doing everything possible to bring the electric car into the range of moderate prices.

Undoubtedly there is a certain class of people who will buy a certain object simply because it is expensive. These same people buy automobiles as they would clothing, furniture, or anything else by price rather than by an examination into the return for the money. With an electric the first price has no bearing on the upkeep cost. With a gasoline automobile the more expensive a car the more it costs to run because it is generally heavier and larger. There is a very good reason, then, for buying the best that the market affords when purchasing an electric.

The Optional Equipment Factor

At the same time it is not fair to assume that people wish to pay for the indulgence of the tastes of others. Where a concern offers a wide range of options in mechanical details and in upholstery and finish, the price must go up. Standardized production ceases and price goes up not only to the man who takes special fittings but to the other who takes the stock job. The difference in the policy of different manufacturers on the matter of optional equipment is important because it is this policy which governs price to such a large extent. It is doubtless true that the man who buys an electric wants quality, but it remains to be seen if he wants this quality at the lowest possible price or not. Standardization in design and in manufacturing methods may always be expected to produce some effect on prices.

MANUFACTURERS' MERCHANDISING

*Third Article of
The Automobile's
New Department*

*Manufacturer
to Distributor,
Dealer, Buyer*

Farm Tractor Field Offers Big Opportunities to Manufacturers of Parts and Accessories for Cars and Trucks

A FEW days spent at the Kansas City tractor show held in that city last week was sufficient to convince us that many manufacturers are hopelessly behind in the question of farm tractors. Thanks to a few of our very progressive makers of parts, components and accessories, the farm tractor business has developed as it would not otherwise have done, but while perhaps 1 or 2 per cent of our automobile parts makers have grasped the possibility of the tractor business the others have apparently scarcely even heard of it.

1,000,000 Tractors Needed

The tractor business offers good possibilities for the makers of parts from motors all the way down through the gamut. Last year approximately 40,000 farm tractors were built. This year may see 70,000 built. It is estimated that we will need in the next few years nearly 1,000,000 tractors. Various estimates have been made as to how many farm tractors will be needed in the country. The figure has been placed at 1,500,000, but it is just about as sensible to make that estimate as an estimate made 10 years ago on the number of automobiles that could be sold would be sensible. There are 6,000,000 farms in the country and naturally everybody looks forward to the day when every farm will have a tractor. We also look forward to the day when some farms may have two or perhaps three tractors. The entire possibilities are so great and the future so uncertain that it is impossible to estimate what even the home demand will require. Then there is the foreign field which has big things in store. The American farm must be powerized and the farms in foreign lands will also have to be tractorized.

Leads to Better Car and Truck Engines

There are many possible fields for the parts maker in the tractor business. Already two or three aggressive engine builders have become well established in the tractor business and the names of automobiles are better known in the tractor field than the names of motor makers not building for the automobile trade. These motor makers from the automobile side have done excellent work. They are making better motors for farm tractors than they built for automobiles or motor trucks. They have built better motors because they had to. The service on a tractor motor might be expressed as 100 per cent load all of the time. There is no coasting with the tractor motor, no let up from start to finish, excepting when plows are lifted out of the ground at the end

of a field, and when other farm implements are similarly briefly relieved from service. On the other hand the motor in a motor truck might be said to be working at its average for 45 per cent of the time; and going a step further the motor in a passenger car has only about 15 per cent of heavy service. As a result we have had to have better motors for tractors than for trucks or automobiles; and here the new industry is making the older industries better. We will have better truck motors because of the tractor industry and better automobile motors because of the tractor business. Here is how this works out: The farmer has demanded an engine that will use kerosene and of course the tractor maker has been compelled to give him motors that will do something with this fuel. As a result motors have been improved and better work done on tractor motors than on truck motors. The combustion chambers have been improved in design to remove hot spots which became impossible under 100 per cent tractor service but which got by with the light service in trucks and automobiles. Then, too, better piston and ring fitting has been necessary in order to use a fuel that if not all kerosene has been perhaps half gasoline mixed with half kerosene. The kerosene has worked havoc with lubricating oils and better engine workmanship has been necessary to prevent this.

Magneto Service on Tractor Is Hard

What has happened with engines for tractors has happened with other parts. Magneto service on a tractor is much harder than on a truck. Better lubrication is necessary, as well as better prevention from dust. The tractor works in a cloud of dust and so calls for 100 per cent efficiency in dust prevention.

Carbureters have had to be much improved and during the past year the air filters have been developed and perfected to a workable extent. These dust filters remove pints of dust from the air passing to the carbureter in a single day. Every tractor must have an air filter. There are several on the market but there is room for more.

Hand in hand with air filters has been the demand for devices to handle kerosene, or at least a fuel heavier than the gasoline used in automobiles. The application of heat to the entering air has been followed by many but this method cuts down the volumetric efficiency and a tractor engine requires all the efficiency it can get. Here is room for invention and development.

There are literally scores of features in connection

with the tractor trade which afford opportunities for parts makers. One of these is in the development of a good gearset for tractors. Such a gearset may afford only one speed ahead or in a few cases two. It must have a reverse. A year ago many tractors used cast gears, but cut gears are coming into use. There is a good field here. The firm taking it up must make a thorough study of tractor requirements and we would recommend that they follow the circuit of tractor demonstrations that will be held this year. More mistakes have been made by automobile makers jumping into the tractor field imagining that what was right for the automobile was right for the tractor. They found out later to their sorrow the error they had made and then had to go over their steps and learn the tractor business. The same will happen again unless those entering the field make a careful study of it.

Tractor Wheels

The manufacture of tractor wheels offers a good field for some maker. At present there is not a symptom of standardization in this work. No two makers have got together on this. There is no better time to get into such a field than the present.

As yet nothing has been standardized with regard to slide frame members for tractors. There is nothing definite as to the style of member needed, in fact, none of the makers know exactly what is needed. Unquestionably some of our automobile frame makers could better solve this than tractor builders. With 70,000 tractors in the making for this year the field should be attractive enough for automobile frame builders to investigate.

At present all tractors have not front axles but a good many of them have and more will be using front

axles, but a good many of them have and more will be using front axles in the next year or so than at present. To-day there is no uniformity in axles: One machine uses a tubular, another a made-up axle resembling bridge construction, and others different forms. It is observed that the same maker building two similar tractors but in different sizes uses different designs of axles. Unquestionably front axle design in tractors will follow some definite line and that automobile parts maker desiring to get into this field should do so to-day. Again let us repeat that it will be a wise maker who carefully investigates tractor work and does not jump in without making a thorough examination.

There is a hopeless lack of standardization in frames for tractor engines. The fan on the tractor engine has a big job to handle. The fan gives trouble, as does the fan drive. There is no logical reason why fan manufacturers catering to the automobile trade should not supply the tractor trade.

The question of wider use of pressed steel parts for tractors has received very little attention. There is no end to the use of such parts.

The motor hood follows similar lines to that used on the automobile. There is the motor underpan, which gives promise of broad improvement. One maker has already combined the tractor frame and the motor pan in one. It is a very fine job. Then there are guards for the wheels, pressed steel seats and a score of other pressed steel parts.

Steering Gears Need Standard

Tractor steering gears are not as standardized as those on cars and trucks. There are many varieties. Unquestionably some more standard form will be adopted. Several makers are waiting for such.



Banquet held by the Society of Automobile Engineers during the tractor show in Kansas City. Tractor design was discussed

New Rotary Valve Engine Design

Van Keuren Has Single Water-Cooled Valve Lubricated by Oil in Gasoline—Production Cost Low

THE Van Keuren mono-valve engine which has been under development for some time is about to undergo tests in one of the Detroit laboratories. The engine is interesting, as it represents a development of the idea to which inventors have clung for some time. This is the use of an overhead rotary valve. The stumbling block over which most of the designers have tripped and fallen has been in the failure properly to cool the valve, with the result that warping soon occurred, and consequent failure of the engine. To overcome this objection in this particular engine, the cooling water is free to circulate through the entire length of the overhead cylindrical valve.

Drive Chain Tension Adjustable

The mono-valve, as the name indicates, is an engine with but a single valve controlling the functions of all cylinders. The valve is a rotary type, revolving at half crankshaft speed and driven by a high-speed, $\frac{1}{4}$ in. by $1\frac{1}{2}$ in. chrome-nickel steel roller chain. The tension on this chain is maintained by an adjustable sprocket on an additional drive shaft which is used for the magneto. The particular advantage claimed for the construction is the same as that claimed for other engines of the same type; namely, that it has less moving parts than the ordinary type of poppet valve engine, with the same number of cylinders.

The advantage of a single rotary valve engine over the poppet, as advanced by the inventor, is chiefly in the reduction of the number of parts in the valves themselves and in the valve action, including springs, etc. Another advantage is that there is an equal performance of the valve at all speeds.

In the mono-valve engine, which in this instance is 3 by 5 in., the diameter of the rotary valve is $2\frac{1}{4}$ in., and its peripheral speed is about three-tenths of the piston speed and about fifty-one one-hundredths of the peripheral speed of the main and connecting-rod bearings. The valve is lubricated by mixing the oil with the gasoline. About 1 pt. of oil is mixed with 5 gal. of gasoline.

One of the features of construction of the engine is that

the cylinder block is suspended from the valve cylinder. In this way all upward reactions are transmitted to the valve and the valve operates under about 60 lb. maximum pressure per square inch of bearing area. The purpose of this is to allow the cylinders to seat upon the valve members and maintain gas tightness in the cylinder ports. In other words, the seating is directly opposite to the poppet valve type as the cylinders are brought to their seat instead of the valve. To eliminate carbon troubles which have also been prevalent on overhead rotary valve engines, the valve is so shaped as to scrape the carbon from the seat as it is formed.

Another feature of an engine of this type is the possibility of obtaining proper combustion chamber form. In this case, the chamber is conical and machined all over. The spark plug at the side fires directly into the charge. The inventor also claims that the valve never needs grinding.

Some of the data regarding the specific engine which has been made up are given in the following:

Cylinder—Size 3 in. by 5 in.

Piston displacement, 141.4 cu. in.

Horsepower at 2750 r.p.m., 35.

Horsepower at 1750 r.p.m., 23.

Valve System—Half speed internally water-cooled, chain-driven rotary.

Valve-lubrication—By means of fuel spray (area of valve exposed to spray, $12\frac{1}{2}$ in. by $\frac{3}{4}$ in. = 9.5 sq. in.)

Cylinder Port— $1\frac{1}{4}$ in. circular gives a port opening of 17.35 per cent of the piston head area.

Timing—Conservative, $23\frac{1}{2}$ deg., exhaust lead and the same intake lag.

Pi tons—Two-ring type, aluminum alloy. Piston assembly weighs 15 oz.

Connecting-rods—Very light $10\frac{1}{2}$ -in. rods.

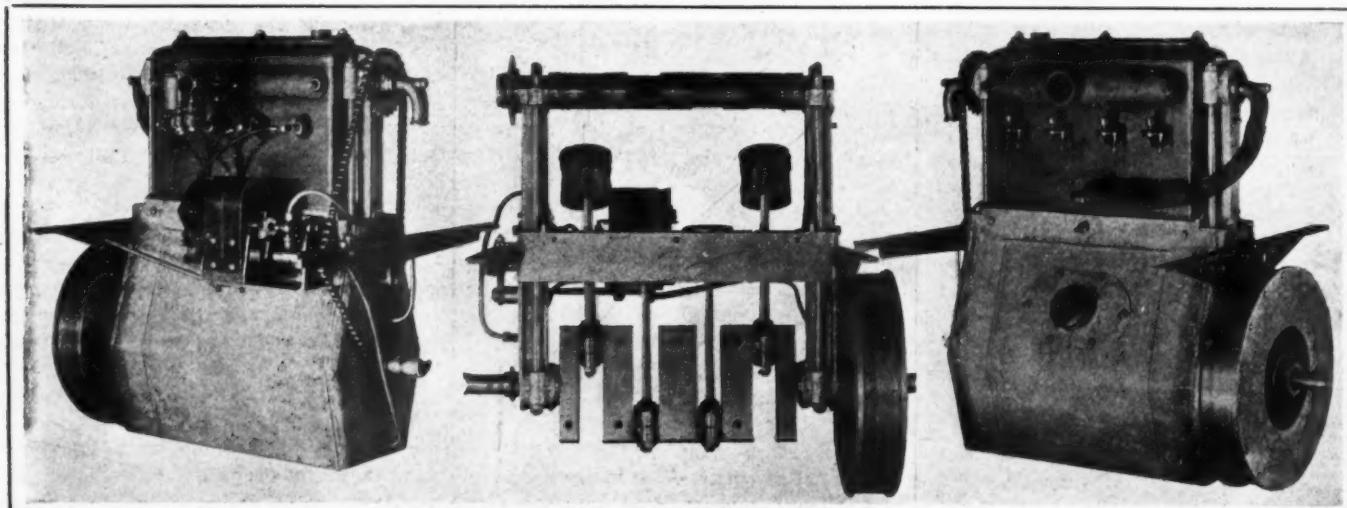
Crankshaft—Two counterbalanced bearings, $1\frac{1}{8}$ in. diameter.

Crankcase—Sheet steel.

Lubrication—Force feed, non-splash gear pump.

Ignition—Magneto.

Cooling—By pump or thermo siphon.



Left—Exhaust side of Van Keuren mono-valve engine, showing exterior water pipe passing through the center of the valve. Center—Method of supporting rotary valve. The cylinder block is supported on the valve and sets itself against it. Right—Intake side, showing valve chain drive carburetor mounting

Engineering Progress Analyzed

Part II

Body Details Could Be Improved—Workmanship Not Up to Par—Other Comments and Criticisms

By J. Edward Schipper
Technical Editor, THE AUTOMOBILE

EDITOR'S NOTE:—This is the second installment of a paper presented before the Detroit Section of the Society of Automotive Engineers Feb. 16, in which Mr. Schipper summarizes the results of an extremely close analytical study of 1917 cars.

IN tire equipment there is an increase in the use of the straight side type. Another noticeable feature at the shows was the large number of non-skids fitted to the rear as stock equipment. The cord tire is given on a larger percentage of chassis and in a lower price field than was the case a year ago, and it is noticeable that while car weights have been going down there has not been any great tendency toward a decrease in the size of tires, showing a tendency more toward overtiring than in the opposite direction.

Bodies Not Satisfactory in All Particulars

Bodies are not altogether satisfactory. There has been a great improvement during the year in the proportionment of space, particularly as regards the front compartment, but there are many instances where it must be said that the driver's seat is actually uncomfortable. In some the driver is quite comfortable after he has seated himself, but during the process of entering and leaving the seat he is a very uncomfortable individual. The point is that a large man physically may often buy a low-priced car and he is the last man to believe that the room in the driver's seat should be proportional to the price paid.

Naturally a longer wheelbase is to be expected on the higher price car, but with reasonable proportioning and care in working out the position of the pedals much can be accomplished. It was interesting to watch some of the taller individuals who were invited to sit in the cars by the ever-alert salesmen. If the salesman were wise he would invite the more lengthy individuals to sit in the tonneau because there were several instances where the knees would come against the lower rim of the steering wheel. All in all, however, the situation, in this respect, is not so bad as it was a year ago. In fact there are a few cases where very good proportions exist in this respect and where one of the big selling arguments of the car was its driver's space. The driver is the owner in such a large proportion of the 3,000,000 cars on the road that he deserves considerable attention. He is the man that pays for the car, and should have as much comfort as his guests who occupy the tonneau.

A very high percentage of cars are sold by the body and therefore the designer should be afforded every opportunity to make the best job he can. This is being more appreciated every year. There was more variety in the bodies at the show this year than last. At that time practically everyone was striving for the molded form which may be said to approach the cylindrical. This year there are a number of prismatic designs in which the side line of the hood is left sharp and distinct. The effect of this variety is pleasing. Regardless of how we like a certain type of design, it is a psychological fact that we lose our appreciation for it if every other design is similar. Variety is stimulating and it must be said that

this effect was much more notable this year than for several years in the past.

Greater Variety of Color

From a superficial inspection of the color designs at the shows, the impression is gained that manufacturers are looking for other colors than black. The colors must be durable and that is the stumbling block of the brighter combinations. There are a number of grays and greens, however, this year and they afford a pleasant relief. Probably if the truth were known some of these other colors are not much more difficult to take care of than the more sombre black. At any rate it is noticeable that colors other than black are more numerous among the straight stock jobs than for some time in the past.

There is an increase in the number of four-passenger cars and a falling off or practical vanishing of the three-passenger cloverleaf type. The four-passenger cloverleaf of to-day is really not a cloverleaf at all, strictly speaking. If it were, the rear passengers would not have enough room. This was the objection last year and designers have given up the idea of cramping the rear passengers simply for the sake of having the body a true cloverleaf. The four-passenger roadster, which preserves the roadster lines with doors only at the front and with entrance to the rear through the aisle between the front seats, is very popular. There were a number of them at the show and they were always surrounded by groups.

While on the subject of bodies at the show a brief mention of the salon idea should be made. There is a class of purchasers who desire individuality in cars just the same as they do in clothing, shoes or in other lines. Some of the biggest dealers have increased their sales and their profits by putting custom made bodies on stock chassis. The salons at New York and at Chicago were well attended and the proportion of actual buyers to attendants is far higher than at the big national shows. In New York one rebuilt British chassis fitted with a fine example of the custom body builder's art sold off the floor of the Astor for \$14,000. This same idea carries back through all the price classes. On the street at New York, just outside of the Grand Central Palace, there was a row of cars fitted with some exceedingly neat speedster bodies painted attractive colors. These sold at an advanced price and although the chassis is one that is very low in price, these little cars with their attractive bodies appealed to a very high class of buyer.

Door Fitting Could Be Better

There is room for improvement in door fitting, according to an inspection of even the carefully prepared show bodies. On one side the doors would be tight and on the other, loose. The shape of the center cowl may also be improved and one car showed a real use for the center cowl by providing in it a

place where the rear windshield could be housed when not in use. Many at the show believed that the rear windshield is coming and it has been said that once it is used, the user never wants to be without it.

Another place where improvement is suggested is in the contour of the upholstery of the back of the seat. After sitting in perhaps fifty or sixty different cars at the New York and Chicago shows, the different effects of the shape of the seat back cannot help but strike one as important. In some the bulge is too high, in others too low. In some it is necessary to sit exactly vertical and in others one actually leans forward if sitting well back in the seat. The most comfortable position seemed to be a slight backward lean with the bulge in the leather fitting the natural curve of the back. Care seems to be particularly necessary where the seat has a pronounced rake, as it is with these that the forward lean is imparted if the curve of the back is not correct.

The arrangement of the extra two seats on the seven-passenger car is better this year on some cars and not very good on others from the standpoint both of appearance and comfort. One maker folds his extra seats under the rear seat, giving perfect concealment. Another maker of four-cylinder cars has a particularly good arrangement with well-upholstered extra seats. These fold into a deep center cowl. One of the particularly good features about them is that the backs are amply padded. A long ride in seats such as these is not the rather painful experience that it is on some of the hard seats without proper backs.

One last feature which needs only mention, as its practicability seems well realized, is the car for all times of the year. For the man who travels with his top up in summer, the permanent top type is supplied, and for those who like nothing but the blue sky overhead, are convertible types.

Novelties at the Show

There is always a novelty or two at the shows. This year at New York there was a front drive car, which drew much attention. The steam car, which is not new with us but which for some time has been absent from the floors of the Grand Central Palace and the Coliseum, was always surrounded by throngs. Another newcomer at New York had a sixteen-valve overhead camshaft engine and still another showed an electric which was simplicity personified, the motor being mounted directly on the rear axle, acting both as a driving unit and as an electric differential.

On the front drive car a stock power plant is used, with the engine mounted as a unit power plant in the usual manner, but the drive transmitted forward to a live front axle. There is a dry disk clutch within the bell housing, and the clutch shaft, instead of transmitting the drive directly to the main shaft of a gearbox, carries a worm. This meshes with a Hindley worm wheel with floats on the differential housing. From this wheel the various reductions are obtained by an orthodox gearbox mounted transversely across the front of the car directly below the worm gearing. All the weight at the front end is carried upon a dead axle with the live axle transmitting the drive from the gearbox and differential, mounted flexibly on each side of the transmission unit. There is a universal at the point where the driveshaft leaves the gearbox and another at the point of connection to the front wheel. This gives a full universal action for the driving member and permits of free steering, which is accomplished by a central pivot located directly in the axis of the wheel.

Some Miscellaneous Comments

It seems fitting that a plea for better workmanship, particularly on bodies, should be made. The buyer of to-day looks into the matter of careful workmanship to a greater extent than is realized by many who deal with the manufacture of the car rather than its sale. The exterior outline has been given a great amount of attention, but just as in buying a

house the purchaser looks not only at a beautiful exterior, but also at the fitting of the woodwork and at evidences of the care with which the trimming is applied. We have a firm foundation in the chassis, a beautiful piece of architecture in the body; now let us have fine workmanship in the interior.

One of the comments which were overheard at the shows is in the growing size of the vacuum tanks. Some of the eight-cylinder cars carry tanks which are particularly large and of which the weight must be considerable. A suggestion which has been made and which may be of merit is that the vacuum tank could be built directly into the cowl. There does not seem to be any necessity for having a cylindrical tank; at the same time a flat cowl tank, having a capacity of a gallon with the vacuum feed system incorporated, would not take up a great amount of space and also would have the advantage of having a good supply of fuel close to the engine, where it has a chance of becoming warm.

In connection with the matter of body space, the distinct increase in the number of tilting steering wheels should be mentioned. One of the most difficult parts of body design is to observe all the correct proportions and at the same time allow of easy entrance into the driver's seat. The tilting steering wheel overcomes this problem very neatly, and one of the points upon which favorable comment may be made is in the increased number of these in use on the stock cars exhibited at the national shows.

A point which would bear the light of discussion is the use of leather substitutes for upholstery. Some of the big production concerns are able to purchase leather in such enormously large quantities that they can use the true product for upholstery. However, there are others who believe that some of the substitutes can be used just as satisfactorily. The cars produced in 1915 used a considerable amount of this artificial material, and on the whole it cannot be said that it was satisfactory. It cracked in cold weather, soon lost its luster and peeled wherever any chafing existed. The cars of 1916 have not shown these difficulties up to such a large extent. It may be, of course, that they have not been out long enough, but with the growing price of leather the question of leather substitutes becomes highly pertinent and is one upon which every manufacturer must be fully informed.

A Few Criticisms

Progress has been made in all departments, and there is room for improvement in all. The three fundamentals, performance, comfort and appearance, mentioned at the beginning of this paper have all been in the minds of the designers, and the results are reflected in the trends noted.

We have a few weak spots such as chassis lubrication, pedal layouts, incompleteness in finish of the body trim and in the handling of the fuel situation. The first mentioned is probably one that is least studied and yet, from the car owner's point of view, is the most important. In one make of car shown at all the shows in beautiful sectional chassis form there are five grease cups under the car, at the center where the driveshaft is divided, and not one can be reached handily except by climbing beneath. There are others who have studied this subject to some extent, and a few are substituting oil instead of grease, a practice which may grow.

In pedal layouts, the position of the clutch pedal and the accelerator are the two worst offenders. It is very difficult to put the foot quickly upon some of the clutches, and for driving in traffic an uncomfortable clutch is very bothersome. The accelerators on some cars are sufficient to give the driver housemaids' knee, or some other uncomfortable affliction after a long drive. One maker showed an accelerator with which the foot can be always kept flat on the floor, the pedal moving sideways for speed changes. This seems to have possibilities, as the greatest strain with the ordinary accelerator comes from the necessity of having the foot resting continually on the side or on the heel.

Foreign Trade Department

U.S.A. Financial Arrangements in Foreign Trade Compared with European Banking Facilities*

By L. J. Burnes

Foreign Department, National City Bank

THE financing of exports as discussed these days seems to be some mysterious process carried on by our competitors in Europe in their export trade, which enables them to far outdistance us—a method with which we are supposed to be not acquainted, and thus in no position to compete for the trade of the world.

We hear much of the long-term credits allowed by Europe, and, from various sources, the way this or that nation does its foreign business in a manner far superior to our own.

One would judge that we were hopelessly lost in the race, but this is not the case if we look at the increasing sales of American goods abroad.

The writings and speeches on the subject of export trade which have been placed before the public during the past year are not intended as a wholesale criticism of the nation in general, but have as their object the awakening of manufacturers in the United States who have not heretofore done an export business to the possibilities that lie before them in the future and the necessity of preparing for these opportunities by a knowledge of the subject.

Export financing in Europe is older than in the United States by force of circumstances and by such circumstances therefore more fully developed. The principles, however, are the same the world over: There must be in the transaction the following elements:

A Buyer—A Seller—Money—Credit

It is the last factor which seems to be the subject of complaint about the United States. That we don't give freely of it is the charge against us, and it is the one thing on which a good export business in manufactured products depends, the thing by which Europe has developed its clientele in foreign countries, not that Europe has lavished credits for years on buyers throughout the world without making them pay for it or without suffering losses. It does neither of these things, nor does the foreign merchant expect credit without paying for it.

Many firms in the United States have for years been doing a large foreign business on terms equal to those extended by Europe. However, the customary method of other manufacturers in beginning their export trade seems to be, where they can sell on the basis of a sight draft with documents attached, not to give anything else.

Such a method will not develop trade unless the foreign buyer needs you very much; as soon as he does not, he goes elsewhere where he may get credit.

There is some justice at the present time in this stand on account of prevailing conditions, but we are now thinking of the normal conditions which will arise at a later date and will have to change a little.

Under normal conditions export financing is conducted from the United States more or less as follows:

A merchant or manufacturer at home sells his articles to the foreign markets.

- 1st—Through export houses both here and abroad,
- 2nd—Through his own salesmen,
- 3rd—Through agents appointed in different places,
- 4th—Through large importing houses in the foreign country, who know the credit risks and have their own force of traveling salesmen,
- 5th—Through getting in touch by mail with large houses in foreign countries,
- 6th—Through advertising,
- 7th—Through the Department of Commerce, as well as the commercial department of our bank, which puts at the disposal of the American exporter the service of placing him in touch with possible buyers in the foreign country.
- 8th—Through the establishment of direct agencies.

Selling Through Export Houses

When selling through export houses, the merchant in the United States as a rule gets cash for his merchandise and thus takes no further interest in the transaction, but the export house does not sell for cash, but for credit, and what it makes on a transaction is to pay for its having built up a system which enables it to know who in a foreign country is worthy of credit.

All the other systems of selling mentioned mean that the seller in the United States must make his transaction based on giving credit to the buyer abroad, and a knowledge of his customer must, or should, be his.

The mere fact that a foreign buyer promises to pay a sight draft with documents attached drawn on him is no guarantee to the exporter in the United States that he is dealing in all cases with a reliable concern. In some countries the goods may be secured without the production of the bill of lading or the filing of a bond as we know it in this country.

Not Behind on Foreign Credits

It has been claimed that we are behind in this country on foreign credits and that this has hampered foreign business. This is not entirely true. The mercantile agencies, as well as the banks in the larger cities, have always had in their files information on many firms in all parts of the world, but cannot force detailed information when it is not freely given as is the custom at home. The reports received from foreign countries are not as exhaustive as those that are available at home where banks and mercantile houses freely exchange credit information. Furthermore, it would not be possible for mercantile agencies and banks to anticipate just what information was wanted. Credit service follows the manufacturing exporter as he opens new territory and must be a matter of development. Europe has been in a position to better us in some respects because they have long exported of necessity and because many more European houses and banks have established branches in foreign countries while we were busy developing at home.

*This is a digest of the paper on financing of exports read by Mr. Burnes at the convention of automobile export men recently conducted by the National Automobile Chamber of Commerce.

After the matter of credit come the terms on which goods are sold, and they vary according to circumstances.

Europe generally buys on fairly short time, many merchants paying a sight draft drawn on them with documents attached. Others demand and get time. Our grain trade, for instance, with Europe is conducted on a C. O. D. basis. Flour is sold on a basis of 60 days' credit, but the documents are not surrendered until the payment of the bill. Cotton has always been sold against reimbursements by the foreign seller in the form of a 90-day sight draft on a European bank. Manufactured goods are usually sold on long terms, and it is not customary to reimburse the exporter by a bank acceptance.

90-Day Sight Drafts in S. A. Trade

Trade of all kinds with Central and South America is done on the basis of 90-day sight draft in practically all exportations.

With China and Japan trade is done at various terms according to custom; also with Australia, India and other countries, but outside of certain raw materials it is safe to say that all manufactured articles are sold on time.

Previous to 1914, most of the transactions with foreign countries were conducted either in the currency of the country to which the goods were exported or on the basis of United States currency and the invoices converted into the foreign currency, either at the current rate of the day on which the draft was made or at a rate fixed by agreement between the buyer and the seller.

In business with India, Egypt or other countries where the currency of the country drawn on did not have a free and ready market in this country, some standard currency was used, such as pounds sterling, French francs, United States dollar or German reichsmark, and with each country some particular custom was (and is at the present in some cases) in vogue.

For instance, business with China is conducted in such a way that a bank in the Far East notifies its correspondent in the United States to buy bills drawn on certain firms in China (who have made credit arrangement with them) by a firm in the United States paying the face amount of the draft to the drawer here in United States currency and, by placing on the face of the draft what is known as the Far Eastern clause, collects from the drawee all interest and bank charges. The bank in the East does not in all cases release the drawer until the bill is actually paid, but even this method provides a system whereby the American exporter is financed, inasmuch as he receives his funds at once and can use them but has on his books a certain credit risk.

In Australia and New Zealand it has been customary for years for the drawee to pay all charges, and under such circumstances a bank in the United States is able to buy bills on Australia drawn in sterling, no matter for what time the draft has to run, on the same basis as it would buy a sight draft drawn on London.

All South American business in the past was done on the basis of pounds sterling.

A Risk in Exchange

In dealing in foreign currencies the exporter at home always has to take a risk in exchange, and, where the margin of profit was sufficient, it was not a source of worry because exchange on the principal foreign countries would fluctuate more or less within a range of 2 per cent and could not fluctuate much more for the reason that gold would be imported or exported, thus sending the exchange rate back to normal. Where the margin of profit was very slight, the exporter sold exchange in advance against his prospect shipment, thus clinching his profit. This is particularly true of the grain and cotton trade.

To-day things are different: Trade is conducted to an enor-

mous extent in United States dollars in places throughout the world where other currencies have been used before. This is due, first to the fluctuating values of the European currencies, and, second, to the fact that New York is the cheaper money market in which to borrow and now enjoys the same privilege of financing by time drafts on banks under the Federal Reserve Law as Europe has had for years.

The part that the banks and bankers in the United States take in financing exports is, in purport, as follows:

They buy from responsible firms and manufacturers in the United States drafts drawn on foreign countries. If drawn in a foreign currency, they buy the drafts at the current rate of exchange prevailing on the day the bill is offered and sometimes will quote in advance prices at which they will buy for future delivery. (Under present conditions where some of the currencies fluctuate 2 or 3 per cent over night this is no longer the case, as such fluctuation is 64 to 96 times greater than in normal times when a variation over night of 1/32 per cent is the rule.)

They buy bills drawn in United States currency on foreign countries, charging interest from the time they pay out funds in New York till they receive returns, generally fixing a certain time for the voyage to and from the foreign country based on average instead of figuring actual number of days.

Interest and Commission Charged

In addition to interest, they charge a commission for handling the bill from $\frac{1}{8}$ per cent up, depending on what the foreign correspondent charges and the foreign bill stamp whatever it may be. In Europe it is generally 1/20 per cent, and the highest cost is Brazil with 1/20 per cent.

Interest, commission and bill stamps are all figured down to a net rate (such as 1 per cent for a sight bill on Buenos Aires), thus obviating the necessity of calculating each item separately.

When all charges are to be paid by the drawee, a notation to this effect is placed on the draft and the exporter gets the face amount of his draft without any deductions, although this is a bad practice, as many drawees refuse to pay amounts added to drafts or claimed from them by collecting banks. It is better to add all charges to invoice and draw the draft for the total amount of the merchandise, plus bank charges.

As I explained before, where custom has fixed that the drawee pays all charges, the case is different.

Bank Extends Credit on Drafts

In buying drafts of all kinds the bank is extending credit or making a loan to the seller of the bill and does not take into account the standing of the drawee, except under certain circumstances. Where a bill is drawn on a commercial firm in a foreign place, the bank considers the seller of the bill as the credit risk for the entire life of the bill; but where the bill is drawn on an A1 foreign bank, the bank may, at its discretion, re-open the line of credit granted to the drawer after the acceptance of the bill. This is the practice, although, should the bill not be paid at maturity for any reason, the drawer will have to make good.

Under the provisions of the new bank laws, banks may accept bills drawn on them at long time against the exportation of merchandise. This is an ideal method of financing export business, which has as yet been little availed of (most of the acceptances so far in existence are against importation of merchandise) and is accomplished by having the exporter arrange with the bank a line of credit which will give him the privilege of drawing on the bank a time draft against his exportation, either by passing through the bank his actual foreign items or supplying it with full details of the foreign transaction, a part of which details appears on the draft drawn on the bank in order to determine that it is

drawn against actual exports. When the bank accepts the bill the holder may discount it in the open market at the best rate and is borrowing money at the rate at which he discounts the bill plus the commission he pays to the bank.

This system, to my mind, has been the strongest feature of Europe's ability to finance to the greatest advantage.

The fact that banks may accept time bills drawn on them is also of great advantage to the exporter who, while willing to give time, wants a good credit risk with it. Instead of demanding from his foreign customer that he arrange to pay cash through a New York bank against documents, he can, with perfect safety, let his customer open a credit in New York whereby he will be enabled to get a good acceptance in return for his documents.

This makes the buyer in the foreign country go to his own bank in order to open the credit in New York and his own bank takes the credit risk, but it gives him time, which is what he wants. Of course, he must pay his own bank a commission, but he does that quite naturally if he cannot get better terms.

Outside of credits opened in favor of the exporter through a bank and goods sold through some firm which will take the credit risk on the foreign buyer, all business must be done by the seller taking a credit risk.

At the present time in the automobile industry, your terms are met by the foreign buyer and he is paying you cash be-

cause he must. When conditions alter it remains to be seen just what changes will take place—competition will no doubt decide in due time.

To some exporters the ideal situation is one where, on the knowledge it may have of a foreign firm, a bank in the United States will buy the exporter's drafts and release him from further obligation. It has been said that this has been done in Europe. It is true that this custom has been practised to a certain extent by one or two banks in a foreign country, but it cannot be a success, as it removes without just compensation the risk that has always existed and will continue to exist between the two parties to a trade—the buyer and the seller. In these days of modern business we may solve it for the benefit of the American exporter, but I don't see why he should be subsidized to that extent.

The part that American banks established abroad play in financing is not different in many ways from banks already established on the ground, except that they give the American exporter, in connection with United States Government officials, intelligent assistance in its trade with the United States and are always ready to take a credit risk on good native concerns to help them finance their purchases in the United States. They protect the value of the United States dollar in international exchanges and stand ready to assist the American exporter to the utmost when consistent with sound banking principles. They cannot do more.

Saxon Production Only Slightly Delayed by Fire

ADAPTABILITY and rapid organizing effectiveness were emphasized as assets of the Saxon Motor Car Corp. by the recent fire at the plant of the company in Detroit. Although the main building was partially destroyed on Saturday morning, Feb. 3, in a week from the following Monday, not only was the office force installed in a newly-leased office building, but also equipment had been installed in a plant $\frac{1}{4}$ mile long, which was under lease and cars were being built.

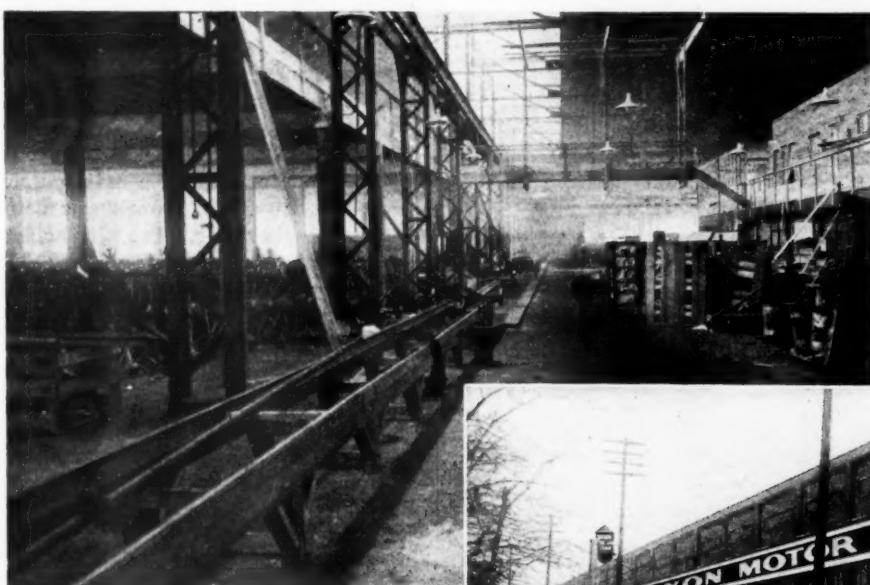
Owing to the fact that the building which was burned was entirely used for assembly, the company had a large supply

of material, including engines, axles, springs, bodies, frames, fenders, radiators, etc., stored in other buildings so that these units were available for immediate manufacture of cars. The company expects to complete all shipments to dealers on schedule time.

The service department was not touched by the fire and the work of replacing parts, etc., for Saxon car owners was able to continue without interruption.

Damage due to the fire is estimated at \$1,250,000, all covered by insurance. The company was protected not only against property loss, but also against loss of profits during any time that the fire prevented or curtailed its shipments of cars.

The present manufacturing quarters have greater floorspace than the damaged building.



Interior and exterior of temporary factory of the Saxon Motor Car Corp., in which cars were being built a week after fire partially destroyed the company's assembly building





The Philippine Islands are the richest undeveloped tropical territory in the world to-day. Their resources have been hardly tapped and the next 10 years hold a wealth of business for the automobile industry. Numbering some 3000 islands, only the most important of which are illustrated on the map, this territory comprises 115,028 square miles. Road development is going on rapidly, some of the 1500 miles of good roads being denoted by black lines. Figures show numbers of cars and trucks in use.

EDITOR'S NOTE:
—This is the first installment of a special serial article on the Philippine Islands as an export field for the U. S. A. manufacturer. The author, Percy Warner Tinan, has been connected with the automobile industry in the islands for 6 years, first with the Manila Times and Philippine Free Press, then 3 years as sales and advertising manager of the largest automobile house in the Far East; and as owner and publisher of Philippine Motor Topics, road guides and directories.

Philippine Islands

U.S.A. Car, Truck and Accessory Manufac
To Develop Permanent Trade in
Only 5000 Motor Vehicles Now

By Percy Warner Tinan



At the present writing there are approximately 5000 motor vehicles in the Philippine Islands. This number includes about 3000 automobiles, 500 motor trucks and 1100 motorcycles. These have been sold over a period beginning with the importation in 1901 of a little "one-lung" belt-driven George Richard. The Philippines did not get the automobile fever, however, until 1910, shortly after the passage of the free trade bill with the United States which meant the removal of the duty on American cars. They had previously paid 20 per cent, the same duty as levied on European cars.

In 1910 there were about 300 cars in the islands, nearly all of them in Manila, and with the exception of four Wintons, two Thomas Flyers, a Maxwell, a Chalmers and a dozen Fords, Manila boasted of a fine assortment of French cars—mostly Renaults, Brasiers and Delahayes selling at \$3,000 up. These cars had all been sold with no road mileage whatever aside from one 25-mile trip outside the city. Road work was going on, however, and, coincident with the passage of the free trade bill, came a more general road-building campaign under the administration of Governor General Forbes. One connection followed another on the provincial road systems and with good American cars at prices previously unheard of in the islands the wealthy and middle-class Filipinos, mestizos—half castes—and Spaniards began to forsake the carromatta, calesa (two-wheeled vehicles) and victoria for more modern transportation.

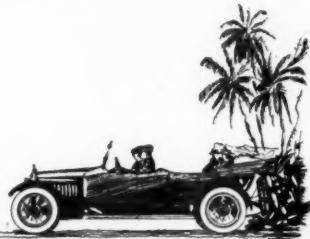
A thousand miles of isle-strewn sea lying about 650 miles southeast of Hongkong constitute the Philippines. Of the



Are Fertile Field

turers Should Seize Present Opportunity
One of Richest Regions of Orient—
in Use by 8,000,000 Population

Part I



3000 or more islands, Luzon, about the size of the State of Ohio, Panay, Cebu and Negros, somewhat smaller, and Mindanao, about the size of Luzon, are inhabited by the great majority of the total population of 8,000,000, and, in the order named, offer the principal field for the automobile manufacturer. Of this population of 8,000,000, about 1,000,000 belong to the non-Christian tribes and cannot in any way be considered as a buying population, aside from such isolated instances as the Sultan of Sulu and his court, and some of the wealthy chieftains and head men who make their homes in the cities. Of the remaining 7,000,000, 50,000 are American, European or half caste, who may be considered a potential buying factor. There is also a Chinese population of about 40,000, among whom are many wealthy Chinese who have just started to buy cars. The American population of the islands is about 6500, exclusive of the army and navy, but owing to the short tours of duty of army officers the 15,000 troops and officers do not count for much as buyers. Sales of cars to army officers will not run over fifty cars per year. The Spanish population is doubtful, as is the exact or approximate number of mestizos. The English, German, French and other European colonies, exclusive of Spanish, will probably total 10,000, and constitute a very potential buying factor as most of them are engaged in profitable commercial enterprises.

Filipinos the Real Car Buyers

During the past 3 years of democratic administration there has been a gradual decrease of Americans in the government service and while the American community has never been a big buyer of cars it is growing steadily smaller, and with the steady increase in the number of Filipinos acquiring government positions, dealers may look for a good increase in car sales inasmuch as a native will buy a car on about one-



Detail road map, showing the principal automobile roads in the vicinity of Manila. There are 1500 miles of good roads in the Philippines and some of the best are near Manila.

half the salary earned by an American. American standards of living are high and automobile operation in the islands is expensive, especially in the case of the average American who feels that it is beneath his dignity to operate a car and turns it over to a native chauffeur who proceeds to run up repair bills, not to mention joy rides and pilfered gasoline. It is nothing uncommon to hear an American complaining of outrageous gasoline consumption and a tire mileage of only 2500 or 3000 miles, usually due to an incompetent and worthless chauffeur.

A glance at a directory of car owners of the Philippines will quickly show who the car buyers are and in this connection it might be said that accurate registration records are kept

DISTRIBUTION OF CARS, TRUCKS AND MOTORCYCLES IN PHILIPPINE ISLANDS SEPT. 1, 1915

Location	Touring	Trucks	Motorcycles	Total	Location	Touring	Trucks	Motorcycles	Total
Albay	59	19	29	107	Leyte	17	26	21	64
Amb. Camarines	22	15	23	60	Manila (City)	1522	274	475	2271
Antique	2	..	4	4	Masbate	2	2	..	4
Bataan	2	..	7	9	Mindanao	49	18	23	90
Batangas	..	..	23	45	Misamis	4	1	3	8
Benguet	24	4	8	33	Nueva Ecija	14	7	7	21
Bohol	4	..	5	9	Occidental Negros	144	3	41	188
Bulacan	56	..	32	89	Oriental Negros	5	2	12	19
Cagayan	2	2	2	4	Pampanga	26	..	26	32
Cavite	11	1	21	33	Pangasinan	39	6	40	85
Capiz	4	..	14	18	Rizal	114	8	53	175
Cebu	70	8	35	113	Samar	7	4	6	17
Ilocos Norte	8	4	..	22	Sorsogon	10	5	4	19
Ilocos Sud	8	4	33	155	Tarlac	7	3	6	16
Ilollo	35	12	15	62	Tayabas	66	3	5	74
Isabelle	..	..	1	1	Zambales	1	..	1	2
La Laguna	37	15	15	67	Total	2512	439	1004	3955
La Union	16	2	4	22					



At the left is a typical cart drawn by a carabao or native buffalo. This vehicle is the chief means of transportation in the Philippines and is only beginning to make way for the motor vehicle

Below — World-touring Hupmobile passing a rice cart on the plains of Nueva Ecija in 1911. During January, February and March 600 of these rice carts arrive in Cabanatuan daily each with a ton or more of rice. There are only two trucks in this province hauling rice

of all cars sold and complete figures may be obtained upon application to THE AUTOMOBILE.

The native Filipino people and the mestizos are the car buyers, present and future, and the instances have not been few where the writer has witnessed a "Pobre," or poor-looking Filipino, wearing his shirt-tail outside his trousers, "costumbre del pais," reach down into his cotton breeches, little more than pajama trousers, and pull out a large roll of bills to make his initial payment on a \$3,500 Renault, Brasier or Panhard, without as much as demountable rim equipment. And this has happened when a completely-equipped American car, at one-third or one-half the price, and of good local reputation has stood alongside the French car. Almost any morning on the Escolta, Manila's main business street, Filipina women attired in very ordinary looking native clothes, chinelas—the Filipino slipper—and smoking big, black cigars or long, fat cigarettes, may be seen alighting from French broughams or limousines or leaning out the windows to call a clerk from a Spanish store who will bring out half the stock for them to look at in the car. The morning dress of the Filipina, Spanish woman or mestizo usually consists of a wrapper that is sometimes so



negligée as to be unsuitable for a shopping tour in America.

These instances are cited merely as examples of the purchasing power of the native who lives in the background of the country's social and business life, city and provincial. They are land owners, house owners and hacienda owners—and they are legion. It should not be inferred from this that the wealthy class of Filipinos all go about in sackcloth and ashes, or hibernate from year to year. Quite on the contrary, they are great dressers, love display, are big buyers of diamonds and jewelry and want the most that they can get for their money in a car, and a night at the Malacanang—Governor's residence—or at an official ball at the Ayuntamiento



Establishment of Manila's oldest and largest dealer. Estrella Auto Palace, a French concern. The salesroom, 80 by 100 ft., is at the right. There are a repair and machine shop, parts and tire stockrooms, etc. This company sells Hudson, Hupmobile, Peerless, Jeffery, Denby, Dodge, Oakland, Scripps-Booth, Fiat and four French makes



A hairpin turn on the Atimonan road, 100 miles southeast of Manila, crossing the mountain range on the east coast of the island of Luzon. The picture was taken from the highest of three bridges located one above the other. Until recently it was necessary to back on each of these hairpin turns. Grades on this road run as high as 18 per cent. From thick jungle, filled with flowering orchids, at the top of the range the road leads down through solid coconut groves extending as far as the eye can reach to the fishing village of Atimonan, where there is a very fine bathing beach

will reveal thousands of dollars' worth of diamonds, and wonderful Paris hats and gowns among the mestizos and Spanish women as well as costly dresses of native silk fashioned after the native costumes, among the Filipina women. During almost any night of the Italian opera season, which usually lasts 2 months, the streets about the Manila Grand Opera house are lined for ten or fifteen blocks with everything in the automobile line from a Ford to a six-cylinder Renault limousine.

Manila is, of course, the automobile center of the islands and always will be, owing to its central position, both commercially and as the capital. The increase of cars in the Philippines from year to year will be along the proportion as shown in the accompanying table, with possibly a few exceptions, especially in trucks, which will be taken up later in this article. Manila has a population of 300,000. Tokio, Japan, has a population of 1,500,000. But in neither case can the buying power of these cities be compared with that of American cities of equal size. Manila's buying power from an automobile standpoint can better be determined by classing it with an American city of 75,000. In the opinion of the writer, who is familiar with every detail of the automobile business in the Philippines, Manila will own not less than 10,000 cars and 1000 trucks within the next 5 years.

But the manufacturer or dealer who



Above is a typical scene on the 115-mile section of the Manila South Road to Atimonan. It is all first class macadam and passes for miles through stately coconut groves. Note the Peerless truck

Below—Part of the 30 miles of perfect streets and drives in Baguio, the mountain capital of the Philippines situated in pine-clad mountains 175 miles north of Manila at an altitude of 5000 ft. and near mountains 9000 ft. above sea level. Baguio is reached only by automobile over two remarkably fine mountain roads

does not extend a forceful sales organization beyond Manila, and few of them do so, is never going to get his share of the business of the islands, nor is the automobile business as a whole going to attain the magnitude which it should.

Iloilo, a Progressive City

Thirty-six hours south of Manila by good and frequent steamer connection is the progressive city of Iloilo (E-low-E-low) on the rich island of Panay (Pen-eye), just across a narrow strait from the island of Negros (Nay-gross) the great sugar center of the islands, where increased cultivation and the erection of government sugar centrals bid fair to enormously increase the wealth of the islands. The population of Iloilo is 40,000; of Panay, 743,646; of Negros, 460,000. Manila's largest automobile house has maintained a branch here for some years and has done the bulk of the business in this rich district while other dealers have been asleep on the job. But even this branch is not as progressive as it might be. On both of these islands there are excellent road systems suitable for trucks as well as touring cars, and the former have yet to be introduced to any great extent.

A few hours from Iloilo is Cebu (See-boo) with a population of 60,000 on the island of the same name. The total island population is 592,247. Both of these cities are ports of entry and dealers established there could have their cars shipped on steamers that call either before or after their Manila stop. The island of Cebu has the greatest road mileage of any island except Luzon and the roads are built for the heaviest truck traffic, of concrete and macadam, and like all of the modern roads in the Philippines are the equal of any in the United States or Europe. There are 170 kilometers of first-class roads, 300 kilometers of second-class roads and 139 kilometers of third-class roads, the first two classes being open to truck traffic during the entire year.

A glance at the table will show that there were only twenty-five trucks on these islands on Sept. 1, 1915, and the number has not increased by over 30 per cent since that time. Most of these trucks are in the cities of Iloilo and Cebu and when account is made of the thousands of tons of produce that are annually hauled over the roads by slow and cumbersome carabao carts the field for trucks is easily imagined. About the only reason that no more trucks have been sold in these provinces is because dealers have never properly worked up the business.

Still further south, about 48 hr. from Manila, is the charming little city of Zamboanga, on the island of Mindanao. Zamboanga is not a great market for cars, owing to its limited roads but the big island with its miles and miles of fertile ground that has scarcely been scratched, and its great forest

tracts, is destined for a great future as road development increases, and capital realizes the possibilities of the Philippines as a field for profitable investment.

There will never be a boom in car sales in the Philippines. The growth will be steady for years to come and the manufacturer who establishes himself now will reap handsome dividends in the future.

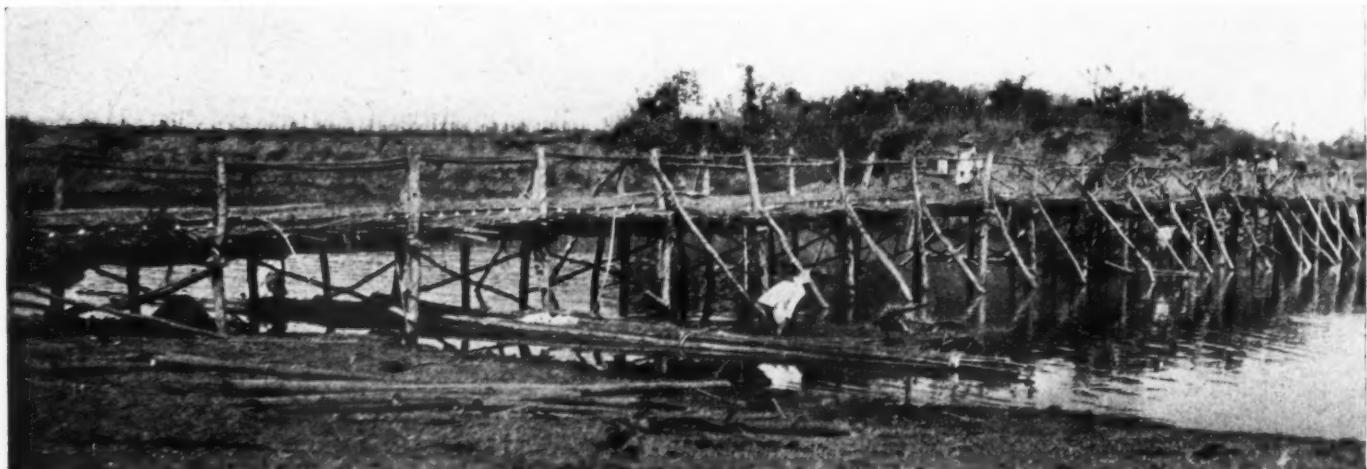
The following table shows the average weekly car sales in different periods since 1913 in P. I.

	Cars
July 1 to Dec. 31, 1913	8
Jan. 1 " July 1, 1914	12
July 1 " Dec. 31, 1914	13
July 15 " Dec. 15, 1915	10
Dec. 1 " May 31, 1916	16
June 1 " Oct. 15, 1916	18

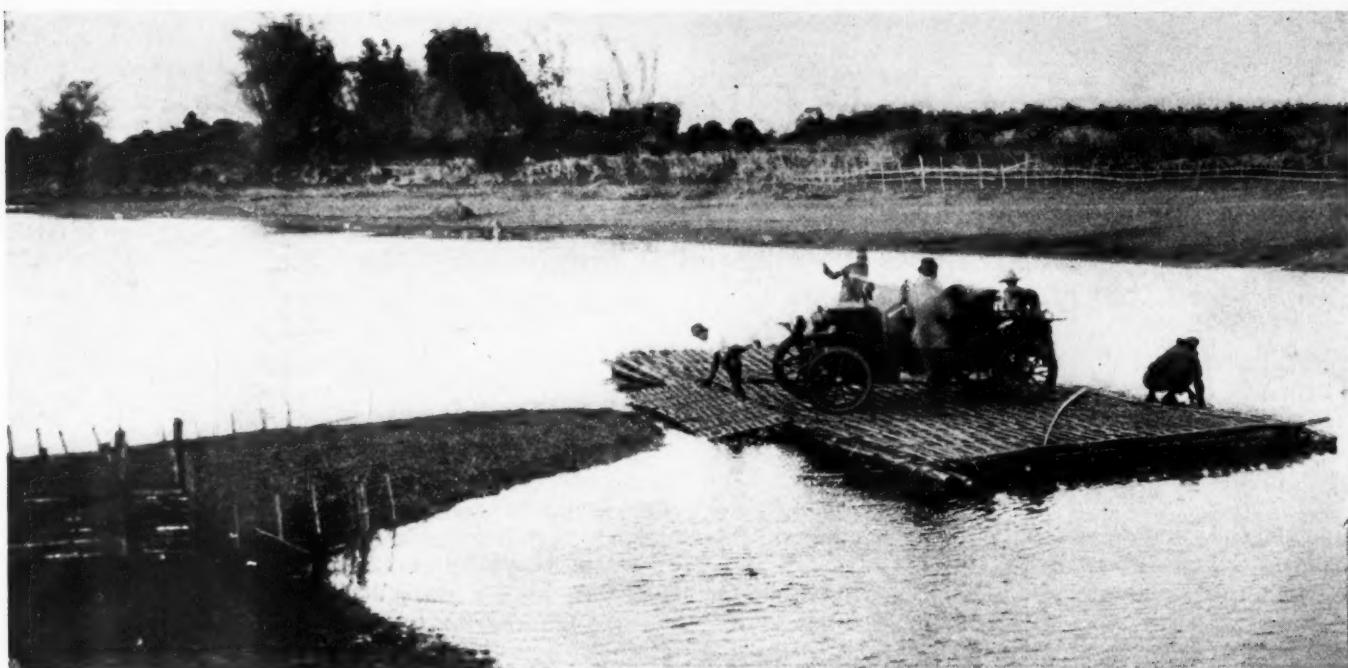
To go back to the island of Luzon, at the southern extremity, soon to be connected with Manila by first class roads, are the provinces of Albay (Al-by) and Camarines (Kam-are-ee-knees), great hemp producing districts. Both of these provinces already have excellent inter-provincial road systems and by referring to the table again one will note that they showed a total of fifty-two trucks over a year ago. This number has been increased by at least 50 per cent, and the trucks show the result, not of sales organization, but of aggressiveness on the part of two or three Americans who realized the possibilities and "bought" the trucks for passenger and freight



A typical kilometer post on the coast section of the Manila North Road. Hudson car in foreground



Cart bridge formerly at Cabanatuan over which thousands of carts of rice were hauled in harvest time. This type of bridge is strong enough to carry a loaded 3000-lb. touring car. Most of these structures have been supplanted by collapsible deck bridges, the flooring of which is attached to one bank by heavy cables so that when the river rises this floor or deck is lifted off the piles and swung to the shore. When the water subsides replacement is easy



A typical bamboo ferry. Many have disappeared of late years but there are some still left. The carrying capacity of bamboo is very great. For example, the world-touring Hupmobile, the first car to make the 175-mile trip from Manila to Baglio, crossed here on a raft of thirty 4-in. bamboo poles

GOVERNMENT STATISTICS OF CARS LEADING IN PHILIPPINES AND THEIR YEARLY INCREASES UP TO DEC. 15, 1916

Car	Feb. 15, 1913	Feb. 5, 1914	Feb. 24, 1915	June 30, 1915	Dec. 10, 1915
Hupmobile	109	268	421	488	521
Ford	80	133	212	247	301
Overland	66	107	192	228	283
Buick	90	136	188	215	239
Hudson	69	84	114	121	129
Brasier	95	106	120	120	123
White	31	71	101	108	118
Studebaker	5	48	74	97	108
Chalmers	51	81	89	89	89
Renault	51	73	86	87	91
Reo	33	49	61	71	73
Delahaye	25	49	68	70	70
Gen. Vehicle (E)	26	55	55	61	61
Gramm	17	47	57	58	58
Cadillac	20	36	43	53	61
Dodge	...	...	6	48	

Owing to a new registration law which went into effect April 1, 1916, and its slack enforcement, accurate figures of the new totals for Jan. 1, 1917, are hard to obtain, but the increase among the leading cars has been decidedly marked—in Buick, Overland and Studebaker, while Dodge jumped into fifth place with a total running over 200. Altogether there are over 135 different makes of automobiles and trucks in use in the Philippines, many of them represented by one car only. The Philippines have yet to see a Pierce-Arrow, Locomobile, Simplex, Rolls-Royce, Mercedes, Isotta-Fraschini or some of the newer American low-priced cars.

business. The trucks were not "sold." The American's example was followed by two other Filipino organizations.

On the island of Leyte, see table, there is another hustling American organization which also "bought" trucks and has worked up a great freight and passenger business. These companies show the possibilities in other districts if the man at the head of some sales organization will go out and analyze the situation instead of waiting until someone comes around to buy his goods.

Between the province of Camarines and Manila are the provinces of Tayabas (Tie-ah-bas) and Laguna (La-goo-na) which produce about 50,000 tons of copra (kô-pra), the meat of the cocoanut, annually, and boast about twenty trucks some of these owned by the government. But of greater moment even than this astonishing situation are the two great rice-producing provinces of Nueva Ecija (A-see-ah) and Pangasinan (Pan-gas-ee-nan), north of Manila, where most of the 52,000,000 bushels of rice produced by the islands are moved annually and not over four trucks are engaged in the work. The average haul from the hacienda to the depot is

6 to 18 miles. Eighty per cent of this is taken to the depot carabao carts drawn by one or two carabao, each carrying 1 ton. While this situation is in a measure the fault of local dealers, another important factor enters in that while there are miles of road to withstand almost any truck there has been a scarcity of bridges strong enough to carry even a loaded 1-ton truck. Bridging the larger Philippine rivers is expensive but bridges will come in time and that time is very near with respect to these two provinces.

Fine Roads in Northern Luzon

Still farther north on Luzon, on the northwest coast, are the provinces of La Union, Ilocos (E-low-kus), Sur and Ilocos Norte (Nort-tay), which show but ten trucks on the table, the number probably double that at present. With white coral roads "taken care of with a fine tooth comb and manicure scissors"—according to the description given by a famous American tourist who has seen the world's finest roads—these provinces beyond the end of the Manila railroad offer great possibilities for both trucks and more touring cars as soon as bridges are in and traffic thus kept open throughout the rainy season.

So much for the possibilities of car sales, but in closing this subject it might be said that as late as 6 years ago the writer was told by several leading commercial houses in Manila, whom he attempted to interest in trucks, that the motor truck could never compete with the carabao, the native work animal which has done the hauling for the Philippines for 300 years. Manila's 300-odd motor trucks and about 250 more at work in the provinces to-day are a decided refutation of that argument, and the purchase of trucks in Manila by old-time Spanish concerns, who are always the last to adopt any change so radical, presage the inevitable: the doom of the carabao as a transportation factor and his return to the soil to do more plowing and cultivation for a country that to-day depends upon him for rice cultivation and yet does not raise enough of this, its main article of diet, to feed itself, but must needs import from Indo-China. And the time is coming when the hundreds of these animals now in use in cities will not be permitted on the streets. Then, indeed, will the truck salesman have a feast.

(To be continued)

Complete Cork Clutch Facing Possible

Laboratory and Road Tests Indicate That Disks and Sheets of Special Composition May Be Used—Indiana S. A. E. Hears Paper on Cork

INDIANAPOLIS, IND., Feb. 16.—Complete clutch facings of cork for both disk and cone clutches, instead of employing the cork simply as inserts, is now a possibility. Laboratory and road tests indicate that special compositions of cork in the form of disks and sheets may be made to replace leather and fabricated clutch facings, and improving the operation of the clutch.

This announcement was made by Engineer Young of the Armstrong Cork Co. during the discussion of a paper on the production of cork and manufacture of cork products delivered last night before the Indiana Section of the Society of Automotive Engineers, by H. W. Prentice, Jr., manager of the publicity department of the Armstrong company. The manufacture of cork clutch inserts, carbureter floats, gaskets, etc., was explained and illustrated by slides and the making of linoleum such as used

for running boards was shown by moving pictures.

The real feature of the meeting was the announcement of cork clutch facings. Mr. Young stated that these have been under test for several months and so far have not shown signs of failure. He said that though the coefficient of friction of cork varied greatly with its grade and treatment, it was so much greater than common friction materials that it permitted the transmission without slippage of great power and at the same time produced a clutch that was very soft in action.

One interesting feature brought to light by their experiments is the fact that in using the cork sheet as a lining for a cone clutch, it is necessary to increase the angle of the cone from the usual 12 deg. to about 16 deg. Otherwise, the clutch would refuse to release. Extracts from Mr. Prentice's paper appear below.

History of Cork—From Tree to User

By H. W. Prentice, Jr.
Armstrong Cork Co.

CORK is the outer bark of the cork oak, a tree which flourishes in the Spanish Peninsula, Southern France, Italy and Northern Africa. Of the various countries, Portugal is the leader in cork production. Spain is a close second and Algeria ranks third.

The heavy coating of outer bark is removed every 8 or 9 years. So long as the delicate inner skin is not harmed, this process seems to further rather than retard the growth of the tree. The process is simple. They cut through the outer bark carefully, following the deepest of the natural indentations, and then pry it off in large sections by inserting the long wedge-shaped handles of their hatchets.

Not only the trunks but the larger branches are stripped, the latter yielding the better bark. Care must be taken not to injure the inner skin of the tree at any stage of this process, for the life of the tree depends on its proper preservation; and if it is injured at any point, growth there ceases and the spot remains forever after scarred and uncovered.

Strip 5-in. Trees

The trees are stripped, as a rule, for the first time when they have attained a diameter of about 5 in., which they usually do by the time they are 25 years old. The first stripping is known as virgin cork. It is so rough and coarse in texture that it is of comparatively little commercial value. The tree at once sets about forming a new coating which, at the expiration of 8 or 10 years, is also removed. It is known as second stripping bark, a piece being shown on the right of this picture. As a rule the second stripping cork is of fair quality, but owing to the large number of indentations, there is a great deal of waste involved in cutting it up.

But with the third stripping of bark, which follows in about

9 years, the tree begins to yield its best bark, continuing productive, as a rule, for a century or more. Cork trees several hundreds years old, however, are not unknown.

After the bark is removed from the tree it is gathered in piles in the forest and allowed to season for a few days. The thickness of the bark is anywhere from $\frac{1}{2}$ to $2\frac{1}{2}$ in., while the yield also varies greatly—from 50 to 500 lb., depending on the size and age of the tree. The bark is next roughly baled up and carried, either on the backs of burros or in wagons, to the nearest boiling station. Here it is boiled in large vats to render it soft and pliable and to flatten it out for convenient packing. After boiling the rough, woody part can be easily scraped off, reducing the weight of the material almost 20 per cent.

Loaded on the backs of burros, or sometimes in wagons, if the roads are good, the cork is then carried to the nearest railway station for transportation to the cork manufacturing and distributing centers. The long trains of burros—thirty, forty or even 100—present a most grotesque appearance, each animal loaded from head to hindquarters with a huge mass of the light bark.

Grading Is Important

Arrived at the factory, the cork first goes to the trimmers, who cut off the rough, undesirable portions. It is then sorted into a dozen or more grades, according to quality and thickness. The importance of this last mentioned operation cannot be over-emphasized, as the whole problem of the successful and economical manufacture of cork centers about it.

When the cork is re-baled for shipment to America, broad sheets are laid in the baling box to form the bottom of the bale. Above them are placed smaller pieces, which in turn

are covered with larger sections. The whole mass is then subjected to pressure to render it compact, afterward being bound up securely with steel hoops or wire. The average bale weighs 200 lb.

For whatever purpose it is to be used, all bark removed from the immense storage rooms of the American plants is taken first to the sorting department, where, under skilled eyes, the twenty-five or more foreign grades are re-sorted into approximately 150 different classes, according to quality and thickness.

Cutting Corkwood Into Sheets

The corkwood is then softened by placing it in a warm vapor bath. Then by means of a circular steel knife, making hundreds of revolutions every minute and kept at razorlike sharpness the sheets are cut into strips whose width is determined by the length of the cork desired.

From the slicer the strips pass to the blocking machines, where by the operation of a rapidly rotating tubular punch, cylindrical pieces are bored out and released with almost incredible speed.

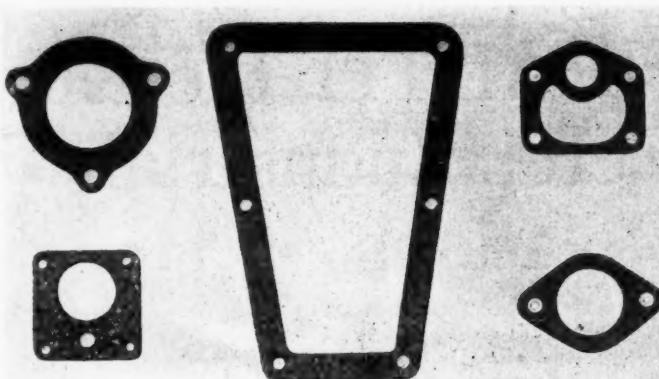
The stoppers which come from these machines are round, with parallel sides. If tapered corks are desired, larger at the upper end than at the bottom, the cylindrical or straight pieces must be passed through other machines.

A host of other useful articles also find their way from the many manufacturing departments to the shipping-room. Of insoles from 15,000 to 20,000 pairs are produced daily. Disks and washers by the million are punched out for use in metal caps for bottles and jars and as gaskets in lubricator cups. Life-preservers, ring buoys, yacht fenders and mooring and anchoring buoys are the specialties of one department. Another pays particular attention to the manufacture of seine and gill corks, and bobbers for fishing lines. So varied, in fact, are the forms which cork assumes, that the complete cataloging of the functions which it fills would be well-nigh impossible. The finest pieces of bark are made into cork paper, so that 350 sheets measure but 1 in. in thickness. Sorted into several different grades, this beautiful velvety material is practically all used in making cigarette tips.

Value of Composition

While natural cork is used for these purposes extensively, as you will see, experience has shown that a cork composition is much more suitable in many instances. The composition that has been developed at Pittsburgh is the result of several years' effort to produce a satisfactory material for use where the temperature does not exceed 212 deg. Fahr. Gaskets made of this composition are not affected by oil, gasoline, grease or water, and may be kept in contact with any of these liquids without disintegration during service.

Not only is the original elasticity of the cork retained in these gaskets, but the process of manufacture tends to in-



Automobile engine and transmission gaskets made of cork composition

crease it. This characteristic makes them especially suitable for use between rough or uneven surfaces and, hence, where cork gaskets are employed it is not necessary to machine pressed steel parts or castings. As was mentioned before, these gaskets do not harden with age, but remain elastic. This composition is of itself liquid-proof and will not become saturated. It is unnecessary, therefore, to put excessive pressure on the gaskets to insure tight joints. Oil leakage has long been a source of expense and annoyance to the car owner and purchasers are now demanding oil-tight joints. Because of their permanent elasticity and imperviousness to liquids, cork gaskets offer the cheapest efficient solution of this problem, especially where pressed steel pans and covers are used.

Effective as Rattle Preventer

The constant resistance of cork gaskets to pressure develops a condition similar to the lock washer in keeping bolts tight. Consequently cars equipped with these gaskets are free from rattling due to loose bolts, so common after a car has been run a few hundred miles.

Since smooth surfaces and excessive pressure are not required to secure tight joints with cork composition gaskets, fewer bolts and bolt holes are necessary. This not only increases the strength of the metal parts, but decreases the amount of machine and assembling work necessary. In many cases the saving effected in this way will practically offset the cost of the gaskets.

Cork gaskets have given excellent results between crankcase and oil pan. Such gaskets should ordinarily be thick enough to make a good fill between bolt holes with moderate compression. Added pressure may be applied if desired, as the cork will squeeze to the thickness of thin paper around the bolts. Any spring in the metal will be taken up by the elasticity of the cork, insuring tight joints.

Boiling water or steam, if kept in contact with the flat face of a cork gasket, would, in time, cause damage. If, however, the gaskets are held under pressure between metal surfaces, they may be safely used where the temperature rises to that of boiling water or slightly higher. A number of builders are successfully preventing hot water leakage by using cork gaskets between the top and bottom plates in assembled radiators on motor trucks, and also between pressed steel water outlet and inlet manifolds, baffle plates and motor head stampings. The gaskets readily conform to the irregularities in the castings and pressed steel surfaces, insuring permanently watertight joints.

Many prominent automobile builders have been using gaskets of cork composition in a number of other places. Some of the more general applications are on cover plates for timing gears, valve compartments, transmissions, oil pumps and accessories to crankcase, clutch and flywheel handhole covers, carburetor intake manifolds, differentials, etc.



Washers and pulley rim cover of cork composition



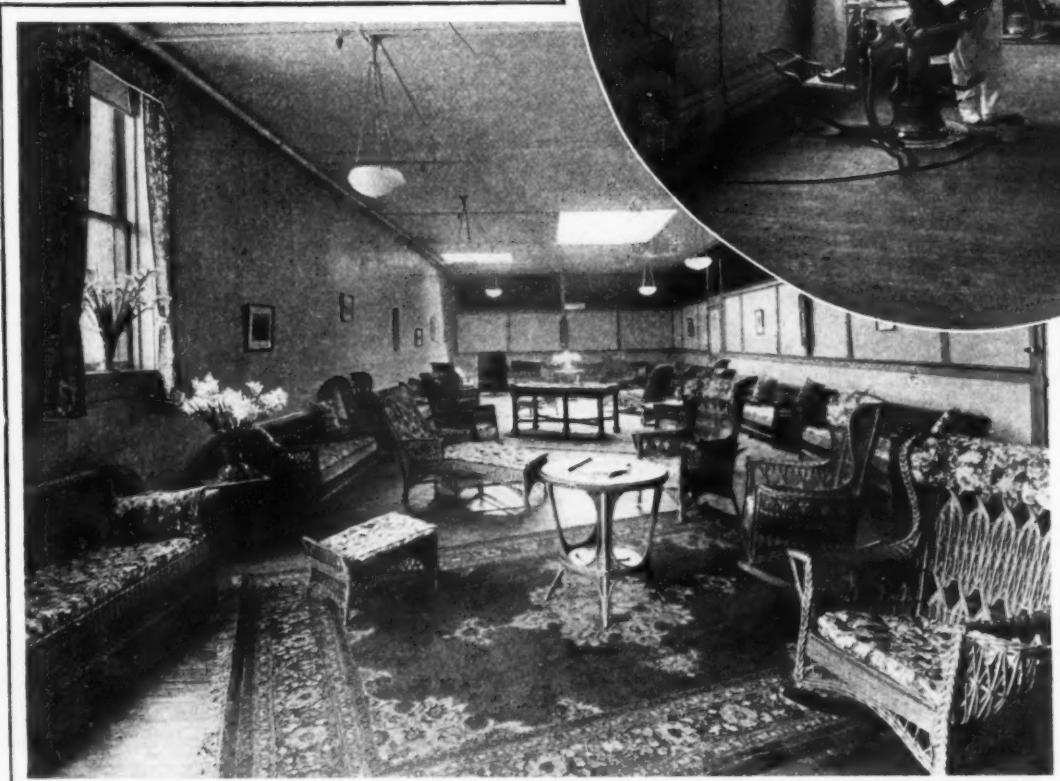
Carburetor, gasoline and oil floats in cork composition

(Continued on page 431)

HEALTH the Key to Better Industrial Relations

A Business Code for Improving Labor

By Allen Sinsheimer



The dental clinic has three operating chairs. It performs temporary relief work for Goodrich employees, in some instances giving full treatment, though co-operation with local dentists is the aim

A large rest room for office girls is utilized for recreation purposes during lunch hour. There are other rest rooms in various parts of the plant so that the women in each department have similar facilities

LABOR is the enigma of the industrial world. After successfully contending with the problems of mechanism, capital and like obstacles which confront him, the average large employer inevitably finds himself involved in the question of industrial relations. Sifting it to the bottom, he discovers an astounding labor turnover with its consequent increase of accidents, defects of product and other evils. He attempts to eliminate the trouble with the introduction of welfare, recreation or profit-sharing plans and the result is the almost countless methods adopted, at this time, by concerns throughout the country.

Many of these plans have failed. A few have been successful. None has succeeded where many employers, in the same community, have adopted it and thus again reduced the competition for workers to an equal basis.

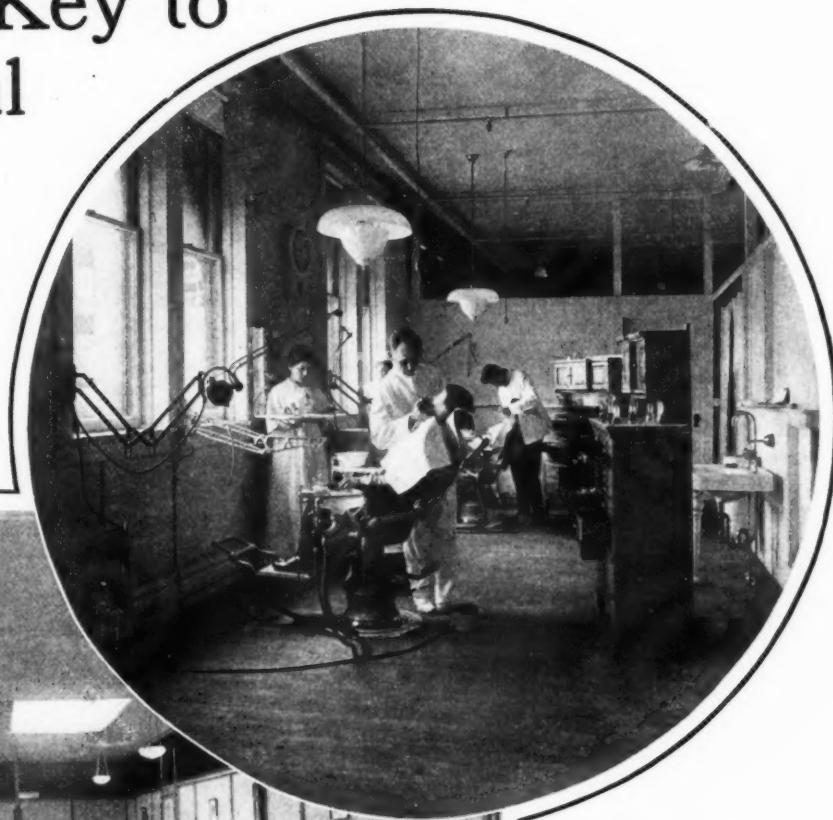
Hence, the B. F. Goodrich Co., Akron, seeking a sound and just basis for improved industrial relations, has evolved a new idea: one that embodies many innovations and is yet in the experimental state, but promises many interesting results. It includes many of the well-known features found in the aver-

age plan but is constructed on the new principle that workers must be contented, ambitious and cheerful, and that the only employees who may possess those qualities are those who are healthy, bodily and mentally. In consequence, the company has introduced a comprehensive system for the maintenance of physical health among its employees and for the development of interest in their strength and well-being.

The work is administered by the Department of Industrial Relations, coming under the executive direction of the vice-president in charge of operations. The department is composed of three administrative bureaus of health, safety and labor.

1.—The department of health is supervised by the health director who is in charge of all medical work done for the benefit of employees and administers the disability compensation. Under his direction come the physical examinations, dispensary work, medical hygiene, and in conjunction with the department of labor, the bureau of social visitation.

2.—The department of safety looks after the provisions for and continuous inspection of the safeguards around machinery



Department of Industrial Relations

HEALTH

Physical Examinations
Medical Hygiene
Dispensary Facilities
Disability Compensation
Social Visitation

SAFETY

Factory Safeguards
Inspection of Safeguards
Convenience Provisions
Hygienic Conditions
Social Visitation

LABOR

Wages and Hours
Working Conditions
Promotion of Education
Labor Control and Standards
Social Visitation

and arrangements for the physical conveniences of employees and hygienic conditions.

3—The department of labor deals at first hand with the employees on all matters pertaining to hours, wages and conditions of labor. Under its supervision come the employment bureau, the bureau of labor control and standards, the bureau of education, and in conjunction with the department of health, the bureau of social visitation.

The bureaus of labor control and standards attend to the interviewing of employees who have absented themselves from work or are planning to leave the company, the continuous regulation of wage rates, methods of work, advice on legal matters and housing.

The bureau of education is intended to extend a broader elementary education to those employees requiring it, and is also in charge of several bulletins, including the house organ.

A discussion of these departments and their scope and de-

tail necessitates a description of the methods of employment and the experiences of the prospective employee from the time he makes his application to his acceptance.

Requisitions are made upon the employment bureau by the various departments when additional workers are required. Every operation in the plant has been analyzed and classified and the employment manager is, in consequence, able to select new workers with an intelligent appreciation of the work they must do.

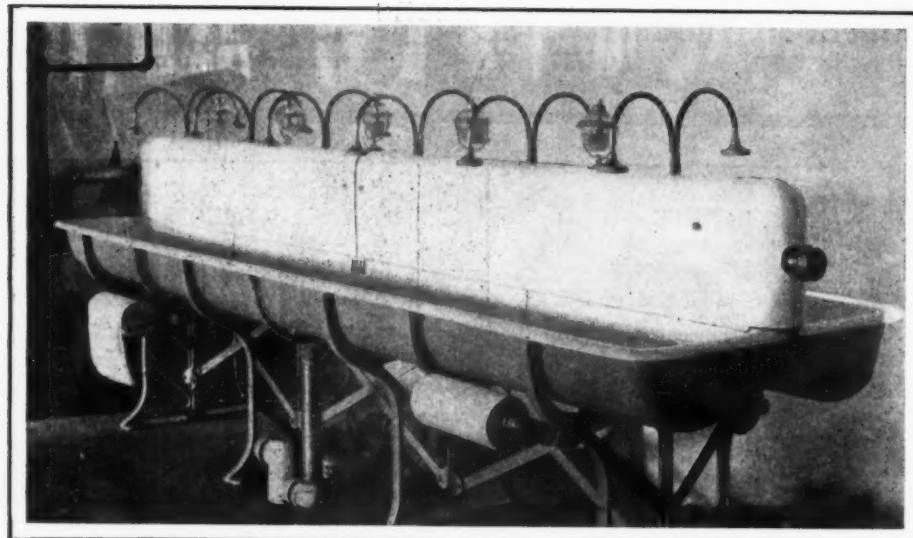
All applicants are interviewed, the questioner asking a series of inquiries printed on one of the four pages of the application blank, two pages of which are illustrated herewith. These include name, birth, domestic life, and citizenship. They are then asked for the names of past employers, addresses, length of service, wages, reasons for leaving. They are next instructed to visit the physical examination rooms.

The second page of the application blank contains numerous

DENTAL CLINIC RECORD												The B. F. Goodrich Company																																																																																																											
												Form 3599-8-10 The B. F. Goodrich Company <table border="1"> <thead> <tr> <th>Class</th> <th>Rate</th> <th>P. R. Number</th> <th>Opinion No.</th> <th>Date</th> <th>Rate</th> <th>P. R. Number</th> <th>Opinion No.</th> </tr> </thead> <tbody> <tr><td>1</td><td></td><td></td><td>6</td><td></td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td>7</td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td>8</td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td>9</td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td>10</td><td></td><td></td><td></td><td></td></tr> </tbody> </table> Employment Bureau Interview Name in Full _____ Date Born _____ City Address _____ State _____ Home Address, Street _____ City _____ State or Kingdom _____ Where Born? Town _____ Is Person _____ Nationality _____ Are You Naturalized _____ What Languages do you speak? _____ Who Languages do you read? _____ Check whether _____ Single _____ Widower _____ Living with Husband _____ Yes or No _____ If not living with Husband, How long separated? _____ If married, How many children do you support? Give number and ages below. B. G. yrs. B. G. yrs. If single, do you support any one? _____ What pay do you expect to earn? _____ After Learning? _____ By whom recommended? _____ Name of any relative or particular friend in our employ _____ What are you doing to improve yourself? Answer below. Mentally _____ Physically _____ Socially _____ Do you carry Accidents Ins. _____ Do you carry life Ins. _____ Do you own your home? _____ Use Savings Banks? _____ To what Lodge, Orders or Church do you belong? _____ How many years Common School? _____ High School? _____ Trade School or Business? _____ College? _____ What studies did you like best in school? _____ What studies did you like least in school? _____ What do you like to read? _____ FORMER EMPLOYERS. <table border="1"> <thead> <tr> <th>Name</th> <th>Address</th> <th>Length of Service</th> <th>Employed as</th> <th>Wages</th> <th>Reason for Leaving</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>												Class	Rate	P. R. Number	Opinion No.	Date	Rate	P. R. Number	Opinion No.	1			6					2			7					3			8					4			9					5			10					Name	Address	Length of Service	Employed as	Wages	Reason for Leaving																																										
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Two pages of the employment blank. The dental clinic record at the left is the last page and the employment bureau interview at the right is the first. The inside of the folder contains a series of detailed questions relative to physical condition.

February 22, 1917



A special model unit stand where workers wash with constantly flowing non-scalding water. It was designed to eliminate the use of the wash basin and its dangers of infection.

questions relative to physical condition, and is forwarded to the examiner to be completed. The examination includes inspection of height, weight, skin, head, eyes, ears, nose, mouth, neck, thorax, lungs, heart, pulse and arteries, abdomen, inguinal region, genitilia, upper extremities, lower extremities, spine, gland and nervous system, following which a diagnosis is made and entered on the sheet.

25 Per Cent of Rejections Reclaimed

Whenever a physical defect is found, a full explanation of the conditions and of the proper treatment is given and in event the candidate for employment has no family physician, he is referred to competent practitioners in Akron. Rejections are made only in cases of serious disability, infectious or contagious diseases. Full information is given regarding the best remedial treatment. Approximately 25 per cent of all rejections are successfully treated and later employed.

Page three of the application blank provides for subsequent physical examinations that may be made.

The examination of the teeth is next in order and the records are entered on the last page of the blank. These show by diagram and answers, the condition of the mouth, the dental service advised, the dental service in the clinic, and whatever x-ray and operative treatment has been advised or extended. Space remains for subsequent examinations.

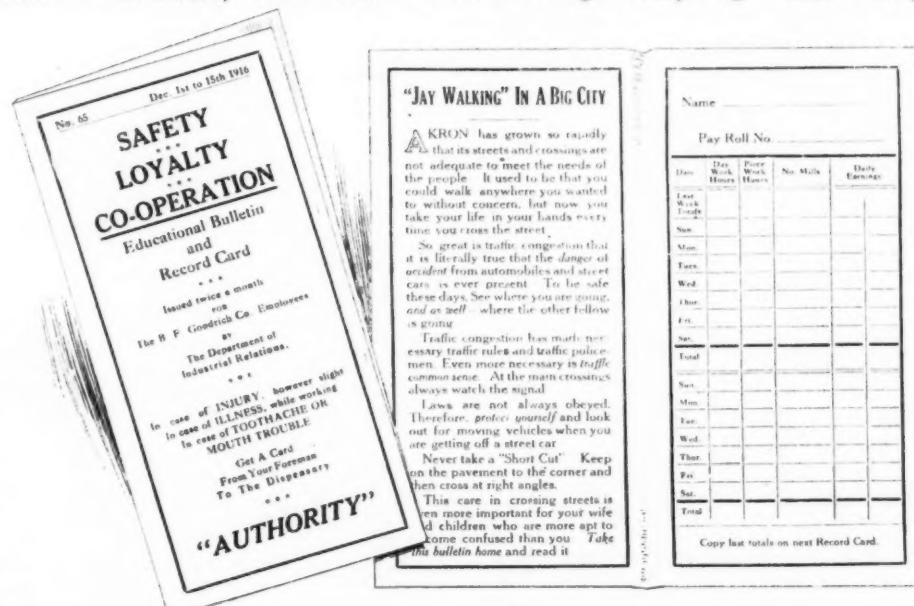
The health department includes eight divisions of administration, statistics, dairy and water examination, physical inspection, dispensaries and laboratories, tuberculosis clinics, dental clinic and social visitation, and comprises a staff of the director, eight physicians, two dentists, twenty-four nurses and a dental assistant. Two of the doctors are women, one in charge of examination of female employees and the other assisting generally in the examination rooms and dispensaries, and supervising the details of disability compensation.

The dental clinic with three operating chairs performs temporary relief work and in some instances renders full treatment but endeavors to cooperate rather than compete with

about 250 absentees daily. More than 25,000 examinations of blood pressure were made during the first year but since only eleven displayed weakened conditions by these tests, the examination has been discontinued.

The disability compensation comes under the direction and supervision of the department of health. It is a plan whereby a worker, unable to perform the duties pertaining to his or her occupation, by reason of sickness or on account of injury occurring in any manner not covered by State or National compensation laws, and not occurring or suffered in the course of any work for pecuniary gain other than work for the company, will be accorded disability compensation subject to the rules of the company, provided the company is notified within 24 hr. after the sickness or injury occurs and that the employee has secured the services of a legally qualified physician.

All factory employees who have passed the physical examination in a satisfactory manner are eligible. Compensation is paid provided the disability exceeds 7 days following which the worker is paid for the period of disability including the first 7 days but not exceeding 52 weeks. Single men receive one-half of their average weekly wage earned during



The educational card and bulletin contains safety cautions, inspirational discussions blanks for work records and a page for personal expenses. It is issued every 2 weeks.

reputable dentists in private practice. To make instruction in oral hygiene practical, tooth powder selling at 8 cents and brushes at 15 cents are purchased at wholesale by the company and thus retailed to the workers. Three gross of these were sold in December.

Next comes the ear and eye room where examinations are made by tests that do not involve the English language. These are conducted by a specially trained nurse and two clerks.

Complete records of all work are kept and the statistics display many important and interesting facts. Physical examinations have been made of 32,739 applicants for employment. Rejections numbering 5478 or 16 per cent were made by the health department but, as stated, 25 per cent were later employed after their health had improved. The visiting nurses call on

about 250 absentees daily. More than 25,000 examinations of blood pressure were made during the first year but since only eleven displayed weakened conditions by these tests, the examination has been discontinued.

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the 3 months preceding disability, and if proof is established that they are the sole support of dependents the compensation is allowed on the same basis as to married men who receive two-thirds of their average weekly wage, provided they contribute regularly to the support of their families. Widowers supporting children under 16 years of age are classified as married men.

Under the disability plan, female employees receive compensation amounting to two-thirds of their average weekly earnings. Married women, though their employment is not encouraged by the company, are entitled to maternity compensation which is limited to 13 weeks, but may not be paid until after the birth of the child, and is only granted to the married women who have been in the employ of the company for 12 months preceding confinement. Except in unusual cases, this compensation is paid only when the prospective mother refrains from work not less than 8 weeks previous to confinement and is attended by a legally qualified physician.

During the first year of operation of this plan, 22,756 cases of disability occurred, of which 3002 were compensated to an amount averaging \$47.02. The average duration of illness among these compensated cases was 33 days.

The effect of holidays on the disability rate is interesting. On the day preceding Christmas eighteen reported as ill as compared with 115 on the day following. On the day prior to Labor Day there were twenty-eight cases in contrast to 138 on the day following.

All employees who are sent home ill, or who notify the company that they are detained at home through illness or injury, are called upon by the visiting nurses within 48 hr. and as often afterward as proves advisable. Those nurses whose districts are not accessible to the street car lines, are provided with coupé cars and chauffeurs. They render bedside care in emergencies, but are mainly concerned in giving instructions in personal hygiene and sanitation and seeing to it that patients follow proper medical advice.

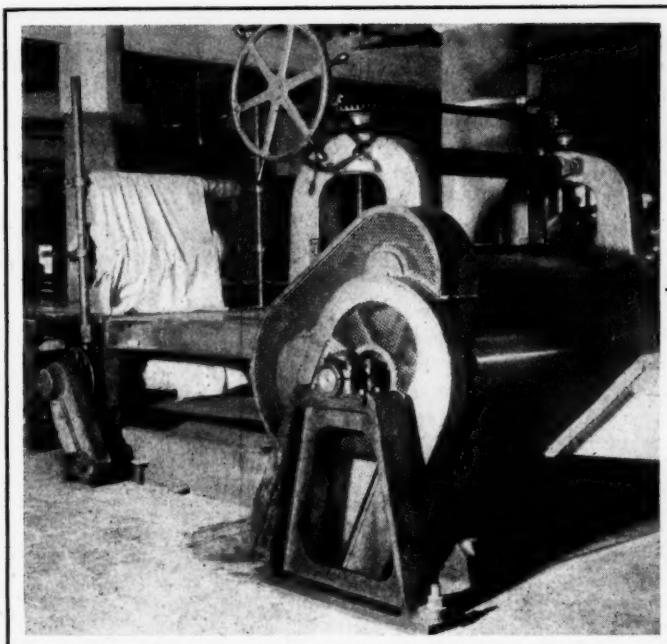
Special Tuberculosis Dispensary

The tuberculosis clinic, which is also under the jurisdiction of the department of health, has been maintained because of failure of public authorities to cope with the spread of the disease, and a special dispensary has been established near the plant for employees who have contracted tuberculosis or are suspected of being tuberculous. These patients are placed on disability compensation and are kept under constant surveillance by a doctor and specially trained nurse both at the clinic and in their homes. Patients, whose home environment is antagonistic to proper treatment, are kept out of doors at the dispensary all day and when practical are given light work to keep their minds occupied without overtaxing their strength. As far as possible, sanitarium treatment is utilized for incipient cases as a means of removing the foci of infection from the community.

Following the physical and dental inspection, the records of which have been sealed so they are kept from the sight of other employees, the new worker, if he has passed all of the tests successfully, is given his application for life insurance and is told carefully of the plan of social insurance which includes life insurance and service annuities besides the disability compensation and maternity benefits.

Insurance Policy Provided

His insurance application is made out to a large company which seeks group insurance, and states when filled in that the employee is making application for insurance, specifies the amount, department in which he is employed, address, birth place and date, sex and beneficiary. The policy is provided for 1 year for all employees of the company who have passed the medical examination satisfactorily, and is renewed by the company yearly at its discretion. Each employee is given an individual policy showing the amount of



Safeguards have been placed about every hazardous machine or piece of mechanism in the plant

insurance payable to his beneficiary. The amounts are graded as follows:

Under 1 year's service.....	\$500
1 to 2 years' service.....	600
2 to 3 years' service.....	700
3 to 4 years' service.....	800
4 to 5 years' service.....	900
Over 5 years' service.....	1,000

These increases are made automatically at the expiration of each successive year of service. Upon receipt of satisfactory proof of the death of an employee, a sum not exceeding \$100 is paid for funeral expense, the remaining insurance due being paid to the beneficiaries in twelve equal monthly installments, unless, at the discretion of the officials, it may be desirable to make payment in a lump sum. Temporary lay-off because of illness or reduction of force is not considered as a break of continuity of service, though when it exceeds 1 year, it is deducted in computing the length of service. Those employees receiving service annuities are not eligible to life insurance.

Service Annuities Paid

The service annuities are paid to all employees who attain certain ages or have specified lengths of service to their credit. Every employee is eligible to enjoy the benefits of the plan. The annuities are paid to:

- a—Any male employee who has attained the age of 70 years, or any female who reaches 65 years, regardless of length of service.
- b—Any male employee 65 years old and any female employee 60 years old with 20 years of continuous service to their credit.
- c—Any male employee 60 years old and female employee 55 years of age with 25 years of service credited.
- d—Any male or female employee with 30 years of continuous service credited.
- e—Any employee with 15 years of service who has been permanently and totally incapacitated through no fault of his or her own as result of sickness or injury.

Service annuities are paid monthly and on a scale as follows:

For each year of active service, 1 per cent of the average monthly pay during the 10 years next preceding retirement.

Thus if an employee has been in the service 40 years and his average monthly salary or wages for the last 10 years has been \$75 per month, his service annuity would be 40 per cent of \$75 or \$30 per month. No service annuities are paid amounting to more than \$100 per month or less than \$20 per month.

The life of the worker is subject to the rules and regulations. The company reserves the right to alter or abolish these rules without incurring or retaining any liability to employees, except to those to whom service annuity has already accrued. The acceptance of annuity does not bar the worker from engaging in other work after a time, as long as it is not prejudicial to the company.

The employee, following receipt of the insurance application and explanation of the social insurance, receives an envelope which contains an outline of these plans and also instructions for safety and health and information regarding the workmen's compensation laws enacted by the State. In addition, he is given what is known as the educational bulletin and record card. These are issued every 2 weeks by the company and contain various suggestions in each issue ranging from safety cautions to inspirational discussions. This folder also contains blanks on which the worker may register his own work record with spaces for the record of days at work, number of pieces of work accomplished, daily earnings and time, and also a blank to be filled out with details of personal expense.

The payroll is so arranged that it automatically records every employee's output and registers after each pay day period, the minimum and maximum earnings for each worker and the average rate per hour earned on each operation. Special markers are placed on the records which display either a marked falling off in an individual's earnings or a failure to maintain the average of operation. All such cases are investigated to determine whether this is the result of personal inefficiency or conditions of operation. Thus, not only is a natural check put upon the incompetent worker but also, constant improvements are made in the methods of production which increase the earning capacity. All factory employees are paid weekly from booths situated conveniently to their work and the entire pay for the complete organization is distributed in 15 min.

All employees who have been absent without notice are called on by the nurses to determine the reason for not reporting to work. Before coming back to their duties they must pass through the labor control station



Caution is the watchword throughout the factory. Signs posted everywhere warn against carelessness on the part of employees wherever accidents are possible

where their time card has been filed, and are interviewed by representatives of the labor department. This aids to detect the laggards and also to determine those who stay home because of domestic trouble or a grievance against the work.

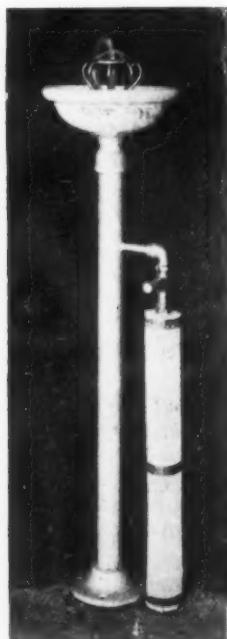
The labor control station also interviews all persons leaving the employ of the company, makes a thorough analysis of the reasons given and in those instances where it is possible, adjusts complaints or extends advice.

Having received the pamphlets, the worker is introduced to his department foreman and instructed in the tasks assigned to him, the general factory routine and the safety appliances surrounding his work.

Safety and Hygiene Department

All safety and hygiene work is under the supervision of the safety and hygiene department which is constantly making an analysis of mechanical and sanitary conditions in an endeavor to improve upon them. Practically every hazardous machine or piece of mechanism in the plant has been safeguarded. Modern well-ventilated toilets have been provided throughout the institution, and facilities for washing which are available to all employees have been greatly improved by a special model unit with separate spouts through which non-scalding water spouts as in a shower thus providing each man with running water and safe-guarding him from the infections which frequently occur when a few basins are used by many men. Liquid soap and paper towels are in each washroom. Individual lockers, heated and ventilated, are soon to be installed. Model bubble fountains of a special type which provide cold water in such a way that the lips cannot come into contact with any part of the metal basins are being installed throughout the plant.

In addition to these valuable features, the company provides lunchrooms of cafeteria style for the various factory forces. Soups, sandwiches, coffee, milk and desserts are sold on a 3-cent basis, and tickets are sold both in strips and books. The lunchrooms do not quite pay for themselves as measured with the expense of maintenance but undoubtedly are paying institutions when it is remembered that the workers secure nourishing food, are kept in the plant, and do not have to rush and bolt their meals.



Fountain designed by the Safety department with no metal at its central point that the drinker's lips can touch

Recreation is another phase of the general scheme. A large rest room for office girls is utilized for recreation during the lunch period and after working hours, and also as a resting place for those who are ill; and unit rest rooms are being provided in connection with the branch dispensaries for the factory force.

A large playfield set aside by the company for the use of the Goodrich athletic association, an organization which stimulates and directs all forms of athletics among the workers, comprises a running track, ball field, 9 tennis courts and plans are under way for erecting a shelter for winter games and general social features. The girls have a camp-site for the summer months on the border of a nearby lake. In these recreational features, the company is always willing to render financial assistance, but prefers that the initiative and the organization should come from the workers.

Extensional assistance is offered in various forms, such as aid given workers involved in legal difficulties. No court work is done, but arrangements are made for the securing of competent legal counsel at a reasonable cost.

A list of houses and rooms for let and of boarding houses is maintained.

A census taken in May, 1916, determined that 49 per cent of all the factory workers were foreigners. Of these only 10 per cent were naturalized, and 48 per cent had a good knowledge of English. There were 37 different nationalities. The company through its bureau of education is co-operating with the public schools in an effort to give adequate instruction in English, civics and elementary subjects.

1200 Volumes in Library

A house magazine, the Circle, issued monthly, aims to interpret the spirit of the company toward the workers and to recognize and stimulate social activities. A library containing 1200 volumes is at the disposal of all and more than 3000 periodicals are received each month and distributed to those interested.

It is through these unusual plans that Goodrich hopes to secure an improved relationship between itself and its workers. The plans, founded on the basis that justice in industry can

come only through intelligent leadership and cordial co-operation, should begin to display results in the next few years. At this time, statements of progress, according to the company's officials, would be haphazard and unsubstantial, since the work is still new and experimental. While definite results have not as yet been obtained, there is hope that a scheme based on health is sound and will bring many benefits which will be important to every employer of labor.

Complete Cork Clutch Facing Possible

(Continued from page 425)

Cork gaskets are easily applied with a thin coating of waterproof cement, or shellac, spread over one of the contact surfaces. Care should be taken not to use too much cement, as otherwise it might squeeze through the bolt holes, causing the gasket to stick on both sides when assembled. The gasket should be weighted down until the cement is thoroughly dry before assembling the parts.

Used for Washers, Packing, Etc.

Washers of cork composition have the same characteristics and are used extensively to prevent rattling and the entrance of dust. They are also used in connection with stuffing boxes where the shaft speed is not high enough to generate heat much above that of boiling water. Not only do they protect the bearings against dust, but they stop oil and grease leakage.

Floats for carburetors, oil gages and gasoline gages are invariably made of natural cork rather than composition. These are produced in several styles to conform to individual specifications. Experience has shown that floats should be coated with a material similar to shellac to give the best results.

Natural cork clutch inserts are supplied in four grades. Natural cork washers for various purposes and natural cork plugs for wire conduits, spark plug holes, etc., are also furnished.

How Continental Tests Flywheels for Accuracy

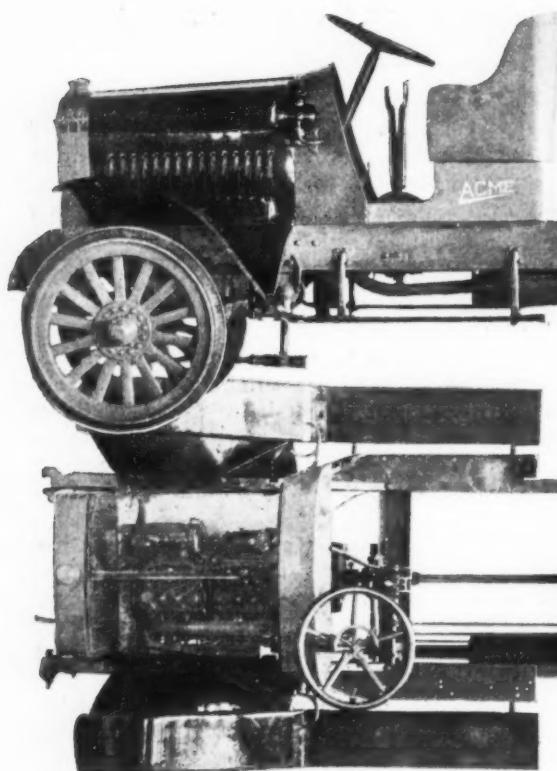
THE accompanying illustration shows the method of testing flywheels at the Continental Motors Co., Detroit. The method of correctly finding out whether a flywheel is true or not is by testing with an indicator dial.

No flywheel which varies in accuracy beyond the prescribed limits is allowed to get by the tester as any inaccuracy will be detected in the motor test department.

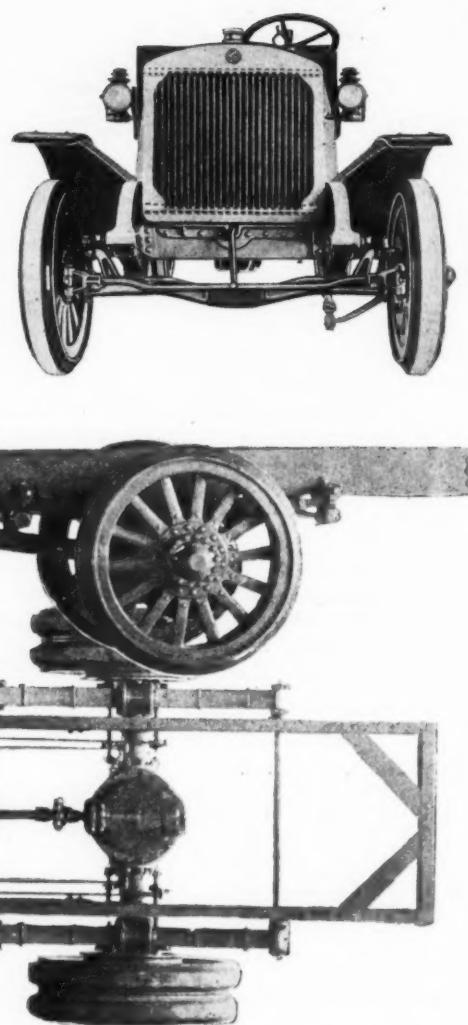
The fixture shown herewith is only one of the many interesting details revealed at the big Detroit plant of the company.



3 1-2 Ton Acme Model for Heavy Hauling



Chassis plan and elevation and front view of the new 3½-ton Acme truck. Note unusually strong frame and substantial cross members



A THREE AND ONE-HALF-TON model has been added to the line of the Cadillac Auto Truck Co., Cadillac, Mich., builder of the Acme 1- and 2-ton trucks. This is designed to meet the requirements of heavy hauling, and completes the company's line. The Acme 1-ton truck is designed to correspond to the requirements of the same type of traffic as would be used with a one-horse dray or delivery wagon. The 2-ton truck is designed to correspond to the two-horse team, and the new 3½-ton to cover the field of heavier weight which has been found to be growing rapidly throughout the country. As would be judged from the class of work to be handled, the new Acme truck is a heavy-duty machine throughout, featured by rigid construction of frame and live members.

Worm Drive and 50-hp. Engine

In general, the new job is a 3½-ton worm-drive truck which may be fitted with any type of special or dump body to meet particular hauling problems. It has a wheelbase of 168 in., and a loading space of 150 in. The turning radius is 29 ft., and the tread is 66½ in. in front and 65¼ in. in rear. It is equipped with a Continental 50-hp. engine, the power being secured on brake test by the Continental company. It has four cylinders cast in pairs, L-head, with a bore and stroke of 4½ by 5½ in. The connection between the driving members and the chassis frame is flexible. The engine is mounted at three points with the gearbox amidship and connected with the drive by two universal joints, and with two additional universals on the propeller shaft, giving four universals in the drive between the power plant and the rear axle.

The engine is the stock Continental type E, fitted with a Pierce governor limiting the speed to 1200 r.p.m. and the truck to 14 m.p.h. Like the other Acme models, this truck is equipped with Rayfield carburetor, Eisemann magneto and Stewart vacuum feed.

In the 1- and 2-ton Acmes, the gearbox is mounted in unit with the engine, but in the new model the amidship location has been chosen in order to break the drive into shorter section. This also divides the weight and distributes it more evenly along the chassis. The transmission units are of the sliding clutch type, with the gears always in mesh. The gears instead of revolving with the shaft by means of splines run free and the hook-up of the shafts and gears is accomplished by a series of dog clutches. One part of the clutch is cut into the face of the gear, while the other slides upon the squared shaft.

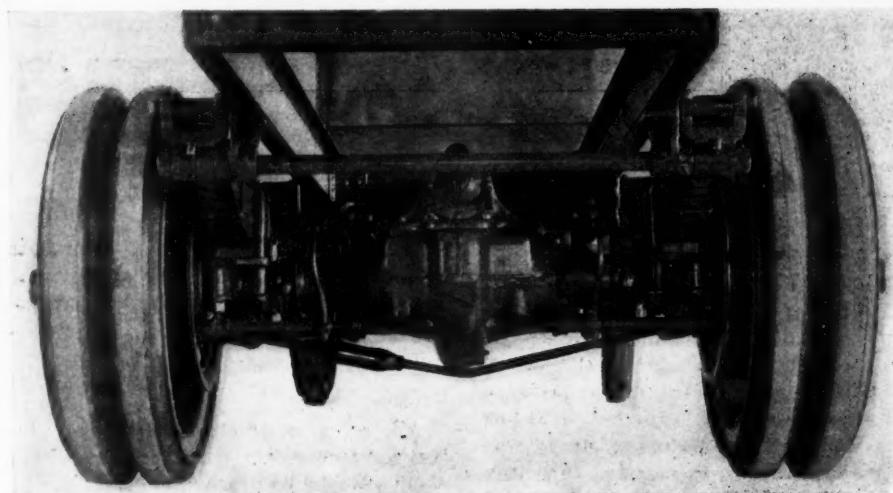
The gears are mounted upon roller bearings which are fitted into the gear hubs. The clutch arrangement is such that when the gearset is in high gear, the other gears are idle. The face of the gear is 1½ in. wide. Between the engine and the transmission the shaft is of heat-treated steel, 1½ in. in diameter, and the shaft between the gearset and rear axle is of 1¾ in. diameter. Three speeds forward and one reverse are provided. The ratios are, in first, 4 to 1; second, 2 to 1; third, 1 to 1; reverse, 4.125 to 1. The reduction in the rear axle is 10½ to 1.

Timken axles, both front and rear, are used. The rear axle is floating, with the axle shafts forged in one piece, heat-treated and splined on one end. With the ratio of 10½ to 1 in the axle, the total reduction in low speed is 41½ to 1, a

sufficient drop to pull the truck through any road on which traction can be secured. The service and emergency brakes are internal expanding, with 21-in. drums on the rear wheels. The extra large brake surface is another point which may be noted in connection with this chassis.

The type of drive used on the Acme 3½-ton truck differs from previous practice. On the 1- and 2-ton trucks Hotchkiss drive is utilized, with the propulsion taken through the top leaf of the rear springs. In the Acme 3½-ton truck the drive is taken through radius rods which are semi-flexible, thereby eliminating the necessity of universal joints and allowing of simple connections. This also carries out the flexible connection scheme between the live members of the chassis and the chassis frame. The torque is taken by the springs in the same manner as on the smaller Acme models.

Another change in Acme construction which may be noted in the 3½-ton model is the adoption of a cast radiator tank instead of the sheet metal tanks used on the 1- and 2-ton jobs. The change in the mounting of the radiator has not been on account of any difficulties with the mountings on the smaller models, but is done because it is thought that, with the heavier spring design, impacts may be transmitted to the radiator. This, of course, is impossible with the smaller models on account of their lighter spring design. The radiator is detachable and is supported from the bottom on a cushion base. The radiator is a Long, and the water is circulated through it by means of a centrifugal pump. One of the points which may be noted is the strength of the frame. This is of 8-in. section rolled steel channel, fitted with the cross members shown in the illustrations, which are gusseted and hot-riveted. The springs are Detroit made, self-lubricat-



Rear of new 3½-ton Acme chassis, showing Timken worm drive axle, heavy springs, large braking surface and dual rear tires. Drive is through semi-flexible radius rods and torque is taken by the springs

ing, bronze bushed, the front being 3 in. wide by 42 in. long, and the rear, 3½ by 54 in. The radius rods which take the drive are of rolled steel section and semi-flexible, a very desirable feature.

14-ft. Body Standard

The overall length of the chassis is 243 in., and it is designed to accommodate a 14-ft. body as standard. Although the wheelbase is 168 in., the truck will be furnished with a longer wheelbase when desired. The gasoline capacity is 27 gal.

The truck is completely equipped, including seats, lamps, horn, jack and tools. The gasoline tank is welded steel. The wheels are artillery with 3-in. spokes rear, and 2½-in. spokes front. Front tires are 36 by 5 in., and rear, 40 by 8 in., or 40 by 5 in. duals optional. The price of the truck, f.o.b. factory, is \$3,000.

Exports of Automobiles, Trucks and Parts for December and 12 Previous Months

	December				Twelve Months Ending December			
	1915		1916		1915		1916	
	No.	Value	No.	Value	No.	Value	No.	Value
Passenger cars	3,664	\$2,710,758	4,911	\$3,658,660	41,864	\$35,045,090	61,947	\$43,725,087
Commercial cars	1,664	3,910,533	1,331	3,689,314	22,094	58,839,303	18,903	52,870,774
Parts, not including engines and parts	.....	1,791,805	.....	1,755,333	.....	16,670,452	.....	24,001,060
	5,328	\$8,413,096	6,242	\$9,113,307	63,958	\$110,554,845	80,850	\$120,696,921
BY COUNTRIES								
Denmark	.....	109	\$96,496	.....	.....	1,516	\$1,126,953	
France	423	\$1,034,581	596	1,898,494	6,304	\$15,922,313	8,477	23,279,846
Germany	.....	.....	.....	.....	4	2,800	.....	.....
Italy	31	15,494	29	13,228	257	160,368	285	171,231
Russia	.....	.....	30	82,492	.....	.....	3,140	8,546,563
United Kingdom	1,366	1,969,048	597	1,507,461	24,356	35,057,597	9,198	17,083,616
Other Europe	608	1,272,807	198	222,192	8,640	22,330,357	4,831	4,647,736
Canada	348	259,110	406	451,685	5,796	4,622,931	12,183	8,965,200
West Indies and Bermuda	308	197,512	464	297,061	3,248	1,877,680	5,935	3,922,906
Argentina	.....	.....	461	243,613	.....	.....	5,105	2,723,705
Brazil	.....	75	35,804	.....	.....	467	292,682	
Chile	.....	.....	313	186,314	.....	.....	1,442	955,394
Venezuela	.....	.....	58	35,393	.....	.....	556	360,315
Other South America	751	363,748	198	102,508	3,537	1,862,326	1,148	708,389
British East Indies	.....	.....	577	452,312	.....	.....	4,573	3,359,379
Australia	392	371,323	230	197,607	4,818	4,075,299	7,567	5,727,233
Other Asia and Oceania	583	762,921	1,291	1,091,641	4,332	6,748,367	9,034	10,842,305
All other countries	455	326,682	497	353,063	2,494	2,063,863	4,669	3,251,632
Mexico	63	58,065	113	80,590	172	160,467	724	603,776
	5,328	\$6,631,291	6,242	\$7,347,954	63,958	\$94,884,368	80,840	\$96,568,861

Accessories

Positive Brazing Paste

ADVANTAGES claimed by the manufacturer for this paste are that it repairs the broken metal all the way through; does not change the size of the part repaired; does not require as great heat as welding; can be done at low cost; makes joint stronger than it was originally; will braze steel to cast iron or any kind of iron one to another, and that it will braze copper to anything made of iron or copper.

In applying the paste rust and grease are removed from the part to be repaired, the pores are filled with paste which is well rubbed in, and after clamping the work in position heat is applied. When the iron is white hot an inch each side of the break borax is applied and then spelter is run thoroughly into the break. When the iron has cooled sufficiently to turn black the work may be taken from the clamp. — Ferro-Brazing Paste Co., 1423 Farragut Avenue, Chicago.

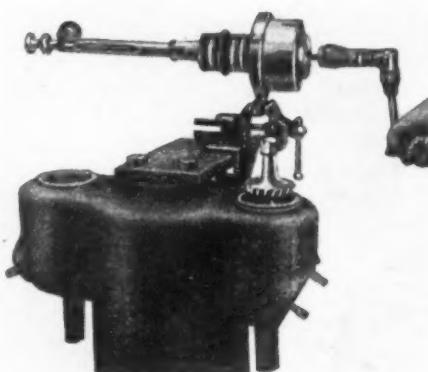
Ellis-Smith Valve Reseater

In refacing valves and valve seats, the operation of this device is as follows: A vise is clamped to a wooden base bolted to the cylinder head, holding the seat cutter reamer guide and valve refacing fixture. The valve is held in the refacing fixture and rotated against a steel knife by means of a bit brace, cutting the proper bevel on the valve. For refacing the seat, a seat cutter is placed in the pilot stem and rotated by the bit

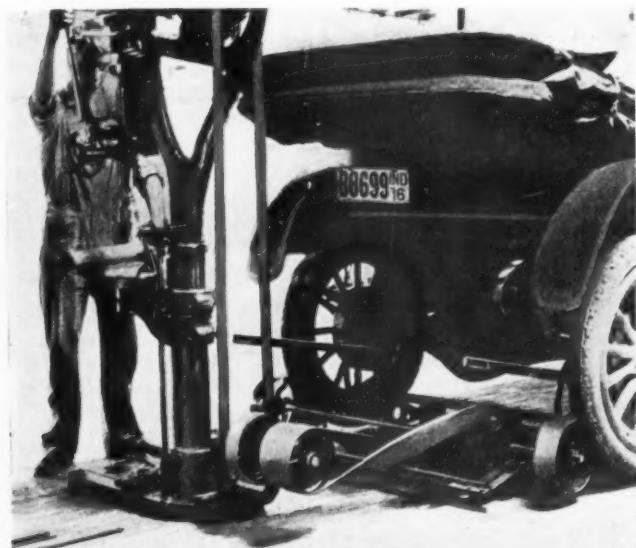
brace. It is claimed that warped valves may be refaced and seats finished without chatter marks. Price, \$30.—Ellis-Smith Mfg. Co., 216 Niagara Street Buffalo.

Helping Henry

All sorts of makeshift devices for transmitting power from the rear wheels of an automobile to machinery, tools, etc., have been developed from time to time, but the Helping Henry is a simple, practical belt-power attachment designed to meet all kinds of conditions. In operation it is placed in position under the rear axle and the two handles and the base rod are pushed down at the same time, thus jacking up the rear wheels and drawing the tires into contact with the rollers of the attachment. Pressure at



Ellis-Smith valve reseater in operation



Helping Henry belt power attachment transmitting drive from the rear wheels of a car to drill press. It jacks up the rear wheels which actuate the jackshaft by rollers.

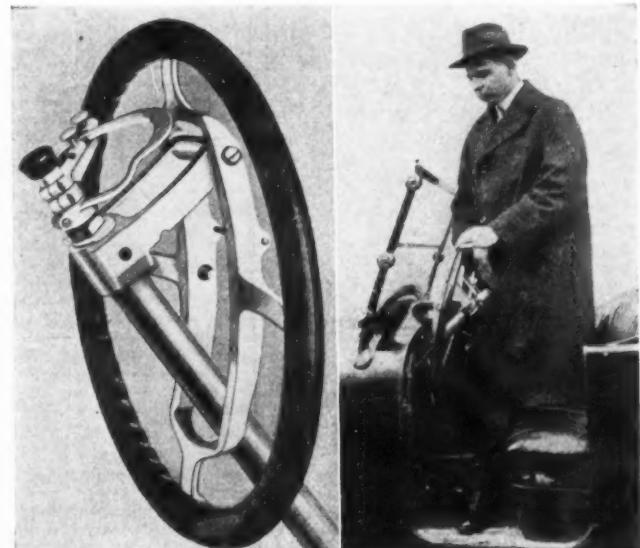
this point is only about 25 lb., enough to prevent slippage, as the framework of the device supports the car weight. The method of drive is illustrated herewith, the device in this instance being connected to a drill press. Various size pulleys are furnished for the manifold uses to which the Helping Henry can be put. Specifications include malleable castings, channel iron frame, ball-and-socket self-aligning, high-speed, babbitted bearings and large oil cups. The device weighs 135 lb.—Autopower Co., LaPorte, Ind.

Vincent Clear-Room Wheel

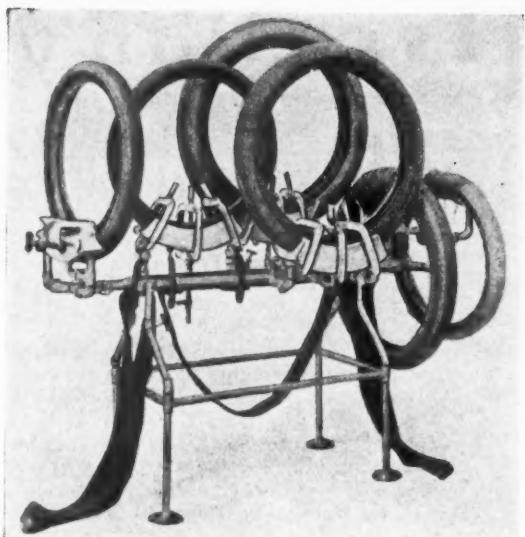
The feature of this steering wheel is that it may be dropped to a tilted position as illustrated herewith, thus giving a wide passage past the driver's seat. A locking arm secured to the steering post and consisting of 7/16-in. hardened and ground taper steel pins on each side of the head and forming wearing plates carries the Clear-Room wheel pivoted on a special spider on its outer end. The locking arm is secured to the post in the same manner as the original wheel. A touch releases the wheel from the driving position to a clearance of over 8 in. Spiders are of close-grained aluminum and the corrugated walnut rims are dished. There is a plain ebony rim on the Ford 16-in. size. Price, largest size, \$12; Ford type, \$6.50.—Vincent Clear-Room Steering Wheel Co., 765 Woodward Avenue, Detroit.

Battle Creek Vulcanizer

A large and light machine for the repair of casings or tubes. Steam is generated in a convenient boiler and circulated through the hot-plates in a manner that keeps it dry and live. Six casings and several tubes may be treated at one time, and though held so as to occupy a minimum space are still accessible to the workman. Each unit is controlled

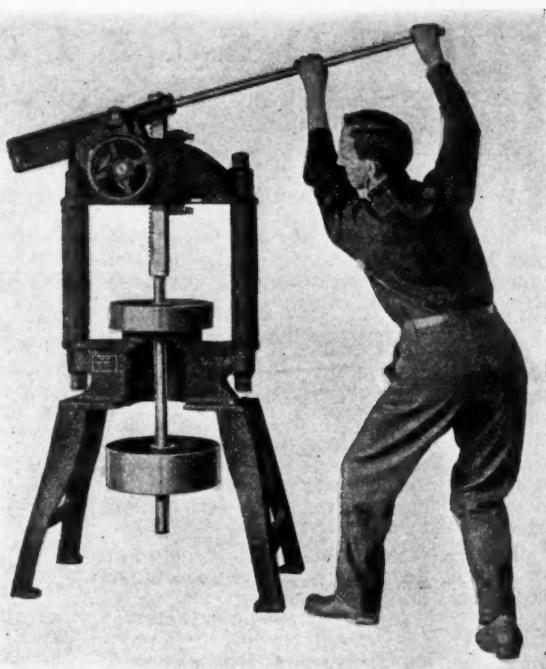


The Vincent Clear-Room Steering Wheel. Left—Detail of the wheel in the tilted position. Right—The wheel in use. Note the wide passage by the driver's seat



At the left is illustrated the Battle Creek steam vulcanizer for the repair of casings or tubes. Six casings and several tubes may be treated at one time

At the right is the Atlas Arbor press for repairshop work. Operating under a leverage of 160 to 1, one man is said to be able to exert a force of 20 tons. Work 20 in. in diameter and 18 in. deep can be handled



by a globe valve, and one or all may be heated at the same time. Price, Model B, \$250, with all bench tools and special clamps; boiler not included.—Battle Creek Vulcanizing Equipment Co., Battle Creek, Mich.

Warner Wheeltilt

This device was described in **THE AUTOMOBILE** for Feb. 1 as one of the new devices brought out at the Chicago show, but the price was given as \$5, whereas it should have been \$1.50. As shown in the illustration it consists of a snap hinge which converts the Ford steering wheel into a tilting type, a strong, simple latch holding it securely when in use and being easily snapped out when to move the wheel into the tilting position.—Warner Gear Co., Muncie, Ind.

Konsrv Engine Warmer

An electric heater placed beneath the hood keeps the motor and radiator warm, facilitating easy starting. It is attached to any 110-volt lighting circuit, using 100 watts per hour. It sells for \$5.—Konsrv Electric Co., 2041 East Third Street, Cleveland, Ohio.

Detroit Hub Cap for Fords

This cap is designed to impart a more substantial appearance to the Ford wheel and to cover points on the metal flange and bolts at the hub which frequently become rusty. The hub cap also makes the

running board appear lower. Selected 20-gage steel is used in the caps, which simply replace the standard Ford caps. They are finished in polished nickel on a heavy copper base and are furnished in cartons each containing a set of four and listing at \$3.75 per set.—Harry Svensgaard Sales Corp., 214 Jefferson Avenue East, Detroit.

Atlas Arbor Press

The Atlas is an arbor press for repairshop work. Operating under a leverage of 160 to 1, one man is said to be able to exert a force of 20 tons. The frames are of special iron, the pinions and rams from heat-treated alloy steel, and all other parts from materials chosen to meet the hardest service. Work measuring 20 in. in diameter and 18 in. deep can be handled, and will remove arbors measuring up to 5 in. The weight of the

press with base is 650 lb. Price, No. 24, \$80; without legs, for bench, \$70.—Atlas Press Co., Kalamazoo, Mich.

Ulticoat Heat-Proof Paint

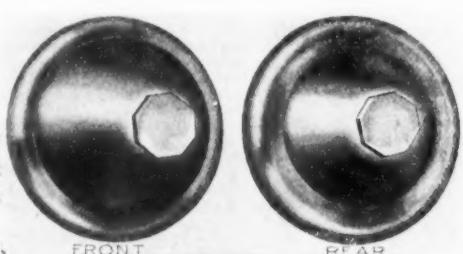
Ulticoat is a mineral paint for use on the exhaust pipe, muffler, hood, and all metal parts subject to heating. It is stated by the manufacturer that heat causes the paint to stick harder to the surface to which it is applied. Price, \$1 per can.—Porcelain Products Co., Pittsburgh, Pa.

Radio Car Heater

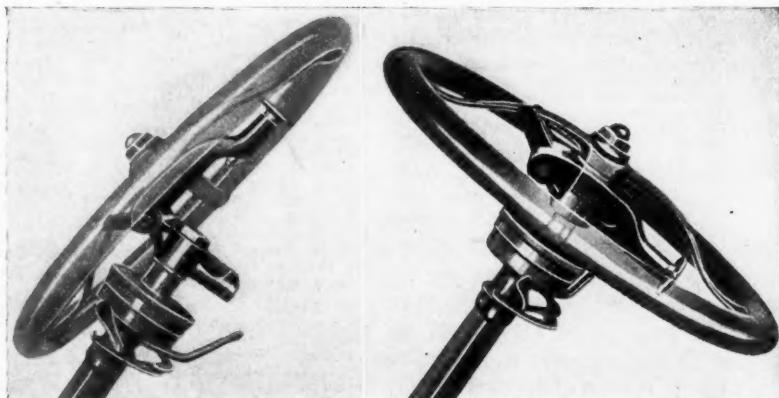
Exhaust gases pass directly through the body of the heater, connections being made to the exhaust by a 1-in. pipe, passing to the heater proper, which is set flush in the floorboards. This heater is a pressed metal box 14½ in. long, 5 in. wide and 3 in. deep. It is claimed to heat a limousine comfortably and to be a good foot warmer for open cars. The installation may be made by anyone in 2 hr., it is said. Price, \$8.—Milwaukee Auto Specialty Co., Milwaukee.



Radio exhaust type car heater



Above—Detroit hub caps for Ford cars selling for \$3.75 per set
Right—Warner wheeltilt for Fords which sells for \$1.50



Industrial Miscellany

Factory

Saxon Motor Car Corp., Detroit, has its present offices at 621 Bellevue Avenue, and the factory is occupying quarters at Beaufait Avenue and Sylvester Street.

Paige-Detroit Motor Car Co., Detroit, has purchased 33 acres of land adjacent to the new site of the Saxon Motor Car Co.'s new plant.

C. R. Wilson Body Co., Detroit, has secured the plant of the Hargreaves Mfg. Co. and will use the 80,000 sq. ft. of floor space it contains for making closed bodies of every type.

Electric & Auto Parts Co., the Morgan & Wright Tire Rim & Wheel Co. and the Economy Metal Stamping Co. have joined with several other manufacturers in the erection of a suburban community near Cleveland, where each will construct factories.

Pan-American Motors Corp., Chicago, manufacturing the Chicago Light Six-Forty, is seeking a location for a factory in some Illinois city. Should some inland city of Illinois be selected as a site for the factory, the name of the car will be changed to that of the city chosen.

Willys-Overland Co., Toledo, has purchased the ground and experimental plant of the Libbey-Owens Sheet Glass

Co., at a price in excess of \$165,000. The purchase was made in anticipation of further expansion of the Overland company.

Perpetual Spark Plug Co. will build a new factory in Dunmore, Pa. The plant will cost \$30,000 and will be 30 by 174 ft. By the addition of new machinery the production will be increased from 1500 to 30,000 spark plugs per day.

Auto Body Co., Lansing, Mich., is running some of its departments night and day on account of press of business. Three hundred men are being employed on the night shift in the machine shop alone. Nearly 1400 men are now in the employ of the company, where but 850 were working a few months ago.

National Acme Machinery Co., Cleveland, will install what is reported the largest wood block factory floorspace in one area in the United States. The structure will be 532 by 600 ft.

Akron Rubber Mold & Machinery Co., Akron, will increase its capacity and add some new equipment.

Briggs Mfg. Co., Cleveland, which paints and trims bodies for the Chandler Motor Car Co., is putting a four-story addition on to its factory. The annex is 220 by 100 ft. and will cost \$150,000. When completed the plant will have a

capacity of 150 car bodies a day. Plant now employs 100 and will later take on 150 more.

Brockway Motor Truck Co., Cortland, N. Y., has had plans prepared for a one-story cement block addition to its machinery shop, 50 by 200 ft.

Ford Motor Co., Ford City, Ont., is making arrangements for a concrete addition to its plant at London, Ont., to cost \$25,000.

Prospect Auto Top Co., Cleveland, has made plans for a factory which will cost \$20,000.

G. G. Bayne Co., Bushnell, Ill., maker of automobile specialties, will build a factory, 96 by 126 ft., costing \$75,000.

Detroit automobile plant, it is stated, will be moved to L'Anse, Mich.

Boone Tire Co., Sycamore, Ill., has decided to establish a branch plant with a capacity of 200 tires and tubes daily, in Chippewa Falls, Wis., local capital having agreed to invest \$28,500 under an ample guarantee. I. V. MacLean is general manager.

Houk Mfg. Co., Buffalo, is erecting a \$25,000 addition to its factory.

Selden Truck Sales Co., Rochester, N. Y., has begun work on a new building which will afford 14,000 sq. ft. of floor space.

The Automobile Calendar

CONTESTS 1917

April—Los Angeles to Salt Lake City Road Race.
May 19—New York Metropolitan Race on Sheepshead Bay Speedway.
May 30—Indianapolis Speedway Race, Championship.
June 9—Chicago, Ill., Speedway Race, Championship.
June 23—Cincinnati, Ohio, Speedway Race.
July 4—Omaha, Neb., Speedway Race, Championship.
July 4—Tacoma, Wash., Speedway Race, Championship.
July 14—Des Moines, Iowa, Speedway Race, Championship.
Aug. 4—Kansas City Speedway Race.
Sept. 3—Cincinnati, Ohio, Speedway Race, Championship.
Sept. 15—Providence, R. I., Speedway Race, Championship.
Sept. 29—New York, Speedway Race, Championship.
Oct. 6—Kansas City Speedway Race.
Oct. 13—Chicago, Speedway Race.
Oct. 27—New York Speedway Race.

SHOWS

Feb. 17-24—Albany, N. Y., Sixth Annual, State Armory, Albany Automobile Dealers' Assn.
Feb. 18-25—St. Louis, Mo., Show, Automobile Manufacturers' and Dealers' Assn.
Feb. 19-24—Springfield, Ohio, Show, Memorial Hall, Springfield Automobile Trade Assn.

Feb. 19-24—Pittsfield, Mass., Show, Armory, J. J. Callahan, Mgr.
Feb. 19-24—Portland, Me., Exposition Building.
Feb. 19-24—Grand Rapids, Mich., Show, Automobile Business Assn. of Grand Rapids.
Feb. 19-24—Duluth, Minn., Show, Duluth Auto Dealers' Assn., Armory.
Feb. 19-24—South Bethlehem, Pa., Show, Coliseum.
Feb. 19-24—Bridgeport, Conn., Show, Armory, Coast Artillery Corps.
Feb. 19-24—St. Louis, Overland Bldg., St. Louis, Auto Dealers' Assn.
Feb. 19-24—Syracuse, N. Y., Show, State Armory, Syracuse Dealers' Assn.
Feb. 19-24—Pittsfield, Mass., J. J. Callahan, Mgr.
Feb. 20-24—Salt Lake City, Utah, Inter-Mountain Automobile Show, Bonneville Pavilion, W. D. Rishel, Mgr.
Feb. 21-24—Wausau, Wis., Grand Opera House, Wausau Automobile Dealers' Assn.
Feb. 21-24—New London, Conn., Armory.
Feb. 21-24—Flint, Mich., Coliseum, Lake Side Park, E. W. Jeffers, Mgr.
Feb. 21-24—Trenton, N. J., Armory, Trenton Automobile Trade Assn.
Feb. 24-Mar. 3—Newark, N. J., Show, Palace Ballroom.
Feb. 24-March 3—Brooklyn, Show, 23rd Regiment Armory.
Feb. 24-March 3—Atlanta, Ga., Automobile Dealers' Assn., Auditorium.
Feb. 26-March 3—Great Falls, Mont.

Feb. 26-March 3—Omaha, Neb., Show, Auditorium, Omaha Automobile Show Assn.
Feb. 26-March 3—Utica, N. Y., Utica Automobile Dealers' Assn., State Armory.
Feb. 26-March 3—Wilkes-Barre, Pa., Hugh B. Andrews, Mgr.
Feb. 27-March 4—Atlanta, Ga., Show, Auditorium, Atlanta Auto Trades and Accessory Assn.
March 1, 2, 3—Urbana, Ill., Show, Automobile Trade Assn. of Champaign Co., Armory of the University of Ill.
March 3, 4, 5—Green Bay, Wis., Show, Green Bay Automobile Dealers' Assn.
March 3-10—Boston, Mass., Show, Mechanics' Bldg., Boston Automobile Dealers' Assn.
March 3-10—Washington, D. C., Middle Atlantic Motor Assn., Inc., Union Bldg.
March 5-10—Brooklyn, Truck Show, 23rd Regiment Armory.
March 5-10—Jamestown, N. Y., Jamestown Automobile Dealers' Assn., Armory, C. A. Hanvey, Mgr.
March 5-12—Birmingham Ala., Auditorium.
March 6-9—Fargo, N. D., A. Hanson, Mgr.
March 6-10—Fort Dodge, Iowa, Northern Iowa Show, New Terminal Warehouse, G. W. Tremain, Secretary.
March 7-10—St. Joseph, Mo., Auditorium, St. Joseph Automobile Show Assn.
March 10-17—Zanesville, Ohio, Muskegon Motor Club.
March 12-14—Fort Worth, Tex., Fat Stock Show, Coliseum.
March 12-17—Vancouver, B. C., British Columbia Automobile Assn., Horse Show Bldg.

March 13-16—Fargo, N. D., Armory and Auditorium.
March 14-17—Mason City, Ia., Armory, Mason City Automobile Dealers.
March 14-17—Davenport, Iowa, Show, Coliseum Bldg., Tri-City Auto. Trade.
March 17-21—Manitowoc, Wis., F. C. Borchert, Jr., Mgr.
March 17-22—New Haven, Conn., Show, Hotel Taft.
March 17-24—Pittsburgh, Pa., Motor Square Garden, J. J. Bell, Mgr. Automobile Dealers' Assn. of Pittsburgh.
March 18-23—Cedar Rapids, Ia., Cedar Rapids Automobile Trades Assn.
March 19—Paterson, N. J., Sixth Annual, Auditorium, R. A. Mitchell, Mgr.
March 21—Trenton, N. J., Second Regiment Armory, J. L. Brock, Mgr.
March 27-31—Deadwood, S. D., Fifth Annual, Deadwood Auto Show, J. E. Nelson, Mgr.
March 31-Apr. 14—Atlantic City, Garden Pier, S. W. Megill, Mgr.
April—Milwaukee, Wis., Spring Show, Milwaukee Automobile Dealers.
April—Calumet, Mich., Show, Coliseum, Frank Ketchell, Mgr.
Apr. 4-7—Stockton, Cal., Second Annual San Joaquin Auto Trades Assn., Samuel S. Cohn, Mgr.
Sept. 2-9—Spokane, Wash., Interstate Fair.
Sept. 9-15—Milwaukee Show, State Park Fair, West Allis.
Sept. 9-15—Milwaukee, Wis., Fall Show, Wisconsin State Fair, West Allis, Milwaukee Automobile Dealers.